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TECHNOLOGY

The Spirit of Technology speaks:

I am young among my sisters, I am young, but I am fair.
I am young among my sisters, but in strength I do and dare.
I march at the head of my sturdy sons, an army thousands strong.
We do the right, we trust our might, and we sing aloud this song:

Chorus:

It is march, march, march
With level and rod and chain;
And it's march, march, march
On valley and hill and plain.
It is clang, clang, clang
At anvil and bench and forge;

And even the bosom of Mother Earth its treasure shall disgorge.

The Spirit again speaks:

I was little, I was weak, when he who long since passed away
Awoke me from enchanted sleep, and bade me look on day;
For at my birth my elder kin, with necromantic art,
Consigned me to oblivion, that they might play their part.
Full well they knew, if once I grew to womanhood, that grace
I had within and strength to win the Atalantine race.
But he came from the virgin land, and kissed me on the brow,
And took me by the hand, and, "Daughter, rise," he said, "for now

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The time arrives when thou and I must join us hand in hand.
 Our souls must wed, and procreate a bold and hardy band
 To journey with the rising sun and drive the mists away
 Which Pedantry for ages long has cast upon the day.
 The ghosts of mediæval learning's vain and flitting crew
 Must vanish, yielding place to men who make and act and do."
 So I arose, and bound my feet with sandals, and my hair
 I gathered in a golden crown, with arms and shoulders bare.
 And he and I in unison, in beauty debonair,
 Stepped out to meet the world;—

Alas! his journey soon was done.

Immortal I, but mortal he. The good and faithful one
 Was gathered to his fathers, and another took his place,
 Of manly mould, of energy, of fighting patriotic race;
 A man to win the hearts of men, a man to love and trust,
 Who gat me children. He in turn was gathered unto dust.
 And other faithful helpmeets came, but I have sturdy grown;
 Attended by my thousand sons, I now can walk alone;
 In full, perfected womanhood, immortal, bold, and free,
 I stand erect. The world's elect are not a match for me.
 I am young among my sisters, I am young, but I am fair.
 I am young among my sisters, but in strength I do and dare.
 I march at the head of my sturdy sons, an army thousands strong.
 We do the right, we trust our might, and we sing aloud this song:

Chorus:

It is march, march, march
 With level and rod and chain;
 And it's march, march, march
 Over valley and hill and plain.
 We span the chasm, we bridge the stream,
 And we fill the earth with the hiss of steam.

It is search, search, search
 In the heavens and in the deep;

And it's search, search, search
In the mine and the rubbish heap.
We delve for the metal that brings man ease,
And we conquer the filth that breeds disease.

It is clang, clang, clang
Of iron and steel on steel;
And it's clang, clang, clang
For cog and rivet and wheel.
Till bolt on bolt, and thole on thole,
The engine grows to a wondrous whole.

It is work, work, work
With hand and eye and brain;
And it's work, work, work
With cheerful might and main.
It is clang, clang, clang;
Each man in his chosen place
Beats out on the anvil of human toil the good of the human race.

L. MAGRUDER PASSANO.

EDWARD ATKINSON.

1827-1905.

In the death of Edward Atkinson, which occurred on Dec. 11, 1905, in the seventy-ninth year of his age, the Massachusetts Institute of Technology has lost not only one of its founders, but one of its firmest friends. While Mr. Atkinson has not been directly connected with Tech for many years, yet he has always taken the liveliest interest in its affairs, and has given its students freely both advice and financial assistance. He had such a firm belief in the excellent work done by the Institute that he had about him a large corps of its graduates. In former years his face was a familiar one in and about the Rogers Building, but of late years he had been seen but little there. He took an active interest in the recent discussion as regards the future of Tech, and, while he was a firm believer and friend of both the Institute and Harvard, yet he believed it best for Tech to stand in the future as it had in the past,—squarely on its own feet; and he wrote several very able articles advocating its independence.

Mr. Atkinson was of an old New England family, and was educated in the public schools. He was not a graduate of a college or other higher school of education, but yet was one of the best educated of men. He was what might be termed a “self-educated” man, although he himself had a great dislike for that term. He had a keen mind and an excellent memory,—two qualities which are necessary for the making of a successful man. He kept closely in touch with all scientific questions, and, while he termed himself a “duffer in science,” he was very far from being one.



EDWARD ATKINSON

1827—1905

His business education began at the age of fifteen, when he entered the employment of one of our Boston commission houses, where he began at the bottom of the ladder. By hard work he gradually pushed his way up, until he became treasurer and general manager of several of our large New England cotton mills. While treasurer of these mills, he was elected, in 1865, a director in the Boston Manufacturers Mutual Fire Insurance Company, and in 1878 became its president. In this position he did, perhaps, the greatest work of his life in developing the "Science of Prevention of Loss by Fire,"—a work which has saved many millions of dollars to the country and also many lives.

To assist him in this work, he called upon Professors Ordway, Lanza, Mrs. Richards, Dr. Gill, Dr. Norton, and other members of the Institute Faculty for advice and research work. In the more direct work of carrying out his plans, he brought about him such men as John R. Freeman, Waldo E. Buck, the writer, Mr. French, Mr. Kunhardt, and many others, graduates of Tech. With these men to assist him he entered upon the work of meeting and handling the many hazards surrounding our manufacturing operations with the great energy which he possessed. The result has been that the fire loss in the two thousand or more manufacturing establishments which were under his direction has been reduced over four-fifths, so that to-day it averages four cents per hundred dollars insured. This great reduction has been accomplished in the face of the fact that there are many more hazards attending manufacturing operations to-day than formerly, such as larger areas, increased speed of machinery, and the use of highly volatile oils. Mr. Atkinson's work in developing the science is so well known the world over that little more need be said on the subject. He was an authority on all matters of mill construction and protection.

In social and economic matters Mr. Atkinson took a very prominent part, not only in this country, but in Europe. He was a member of many scientific societies, and was always a prominent figure at their annual meetings. He was a prolific writer on many subjects, contributing frequently to the prominent newspapers and magazines of not only this country, but of Europe. His writings were devoted almost wholly to subjects which were intended to benefit humanity. He was always found on the side of the weak. Previous to the Civil War he was a prominent anti-slavery man. Since then he has been a great friend of the negro, and in his latter days every one knows he was found on the side of the Filipino. He was also a great friend of the proscribed race.

During his lifetime he was constantly endeavoring to promote methods which would be for the direct benefit of the world. The Aladdin Oven, which was one of his inventions, was primarily designed for the purpose of assisting the working-woman and student in taking care of themselves. While ridiculed by many, it is generally acknowledged that the oven has been of direct benefit in many cases. One of his latest undertakings with the same object in view was that of the development of mud and peat fuel for domestic and manufacturing purposes. At the time of the last coal strike, while walking in the woods and over the marshes near his summer home, his mind was attracted by the black peat or mud under his feet. He immediately saw the possibilities contained in it, and with his characteristic energy began to push the question of mud or peat fuel. In all his undertakings he had the public good fully in his mind, and in no case did he ever derive any financial return from his efforts.

By many Mr. Atkinson was considered to be egotistical. This may have been so. He at least was a man who, having perfect faith in himself and in his opinions, as all successful

men must have, did not hesitate to express himself forcibly. He was never discouraged, although the whole world might be against him. He was an optimist, in the true sense of the word. He had great faith in human nature, and believed that no wrong could endure for any length of time. Most men of independent views are inclined to think that the world is on its way to destruction because the majority of men do not always agree with them. On the contrary, Mr. Atkinson thoroughly believed that all men were well-intentioned and must come to his way of thinking sooner or later. He was usually found on the unpopular side, but this fact never discouraged him nor made him think less of the world. This trait was clearly shown in his writings on the Philippine question, with which so many people disagreed. At that time, with practically the whole country against him, he still went calmly on his way in the full faith that he was right and that time would settle the question according to his way of thinking.

Mr. Atkinson was in great demand at social, literary, and society meetings, not only for his ability to speak entertainingly, but for his own sake. He was the life of all such meetings. He also had a wonderful capacity for work, and was a firm believer in the necessity of work in all stages of life. He could not conceive of even a hereafter without work, as was shown by his last words as he lay dying in the corridor of his office building:—

“This is the end—what is there for me in the hereafter?—There must be work to do, as every one must work.”

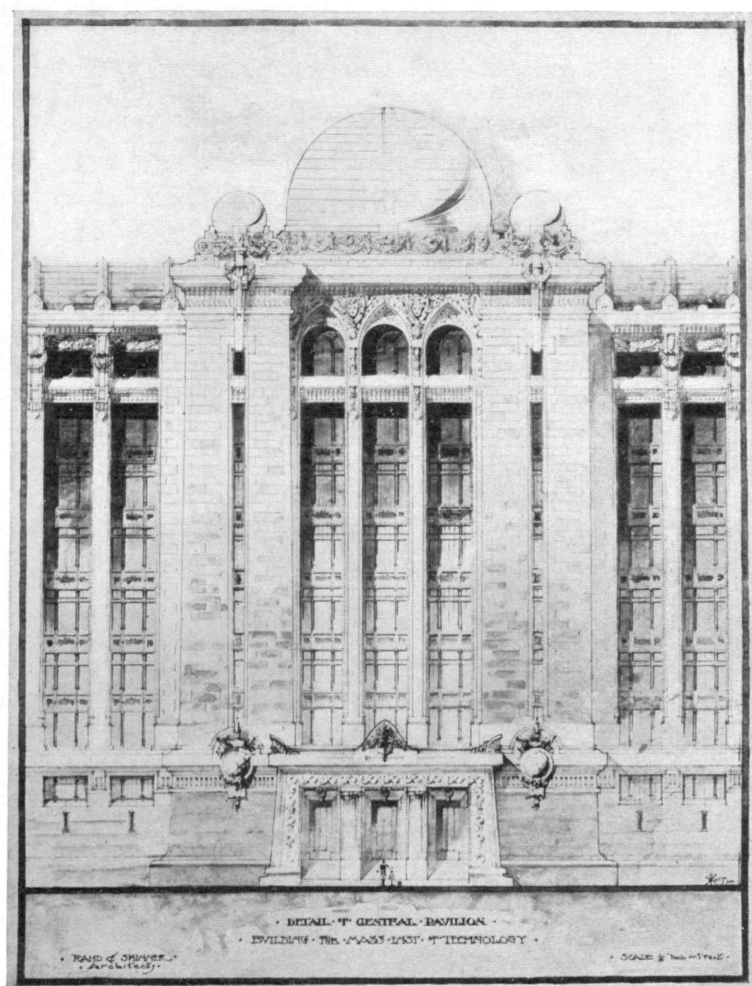
JOSEPH P. GRAY, '77.

A SUGGESTED PLAN FOR A LARGER UTILIZATION OF THE PRESENT PROPERTY OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Technology being a school of Applied Science, it is interesting to consider the problem of additional space from an engineering standpoint, and to give some study to the property already owned with a view to its more nearly complete utilization. The possibility and advantage of carrying the foundations of high buildings into the ground has been demonstrated; and of late the basement stories of office buildings and hotels have been carried to greater depths below than formerly their superstructures rose above the surface. Their architects have located halls, kitchens and store-rooms, with complete refrigeration and filtration plants, laundries, electric power stations, etc., all in well-ventilated, uniformly lighted apartments four and five stories below the street level.

Human laws limit the height to which we may build upward, but only economic laws limit the height to which we may build downward; and, as we look into the future, may we not imagine glowing rows of laboratories with vaulted ceilings and walls of glazed tiles and glass, soft and uniform light permeating all corners, dissipating all shadow and all thought of subterranean caverns, and see Research finding therein new strength and inspiration? To realize that this is not a vision, one has only to visit the subways, the Times Building, and the Hotel Belmont in New York City, where they may be seen in fact.

Modern architectural practice in office building construction secures only an average of about 66 per cent. rentable area per floor of the gross area of the lot; for about 15 per cent. is taken up by walls and partitions, and 19 per cent. by corridors, toilets, elevators, etc. Technology has increased this per cent. of utilized area somewhat at the expense of public spaces and by leaving large areas



undivided. We shall find on examining the figures* that with increased subdivision of space a corresponding increase in the area needed for circulation and in the space occupied by walls becomes necessary, the net usable space lessens, and therefore an average of 75 per cent. of gross area would represent all that we could fairly hope to net in any large increase of our present accommodations. In the subsequent calculations this has been assumed as secured.

The building laws of Boston permit vaults to be built under sidewalks, parkings, and reserved areas to within eighteen inches of the inner edge of the street curb, and the courts have not prohibited us from building below the reservations on the Boylston Street lot, even if they have enjoined us from building upon more than one-third of its area, above the street line.

The area within the lot line and the 18-inch restriction is 96,200 sq. ft. Rogers and Walker Buildings cover 28,557 sq. ft., so a clear area of 67,643 sq. ft. is available for consideration without undermining either of these buildings. Imagine this area excavated to a depth of 60 ft. and a steel frame building of four stories constructed, there would be a gross area of 270,400 sq. ft. secured, netting 202,800 sq. ft. of new floor space, or about double the total utilized floor area of Rogers and Walker Buildings combined, which is 105,898 sq. ft. Remembering also that Rogers Building does not contain

* Table showing gross or lot areas and percentage (%) of same occupied by utilities and also net available renting space in Office buildings and for work in Institute buildings:—

Name of Building.	Gross Area.	Walls and		Net A.
		Partitions.	Corridors.	
Cunard Building	2,940*	14.5	19.5	66
Beacon Building	8,612*	17	17.5	65.5
Paddock Building	6,644*	14.5	19.5	66
Pemberton Building	4,437*	13.7	19	68
Rogers Building	84,110†	23.7	10.8	65.4
Walker Building	70,085†	14.1	13.2	72.5
Engineering Building A . . .	47,106†	11.2	7.5	80.8
Engineering Building B . . .	23,124†	10.7	19.6	69
Pierce Building	55,860†	10.8	8.8	80.4

* Gross area of single floor, including walls.

† Total gross area of all floors, including walls.

in any of its upper stories as much area as it covers on the ground, and that it does not rise to the legal height above the curb, and that the same statements apply, in a lesser degree, to the Walker Building, it is evident that increased space above the curb, still within legal limits, could be obtained by a removal of both buildings and the substitution of others in their places. If this were done,—with four stories below the street and six above,—the grand total of utilizable areas on the Boylston Street lot would be not far from 539,135 sq. ft., or five times the present areas.

Calculations on similar lines show that, if the Trinity Place block were developed, after reserving a lot 100 ft. x 100 ft. for a Walker Memorial Gymnasium, and leaving Engineering Buildings A and B, and Pierce Building as they are, a total of 471,390 sq. ft. of new floor area could be obtained in a building erected around the block and containing a large central court. This would bring the total in this block to 570,251 sq. ft., again an increase to five times the present areas.

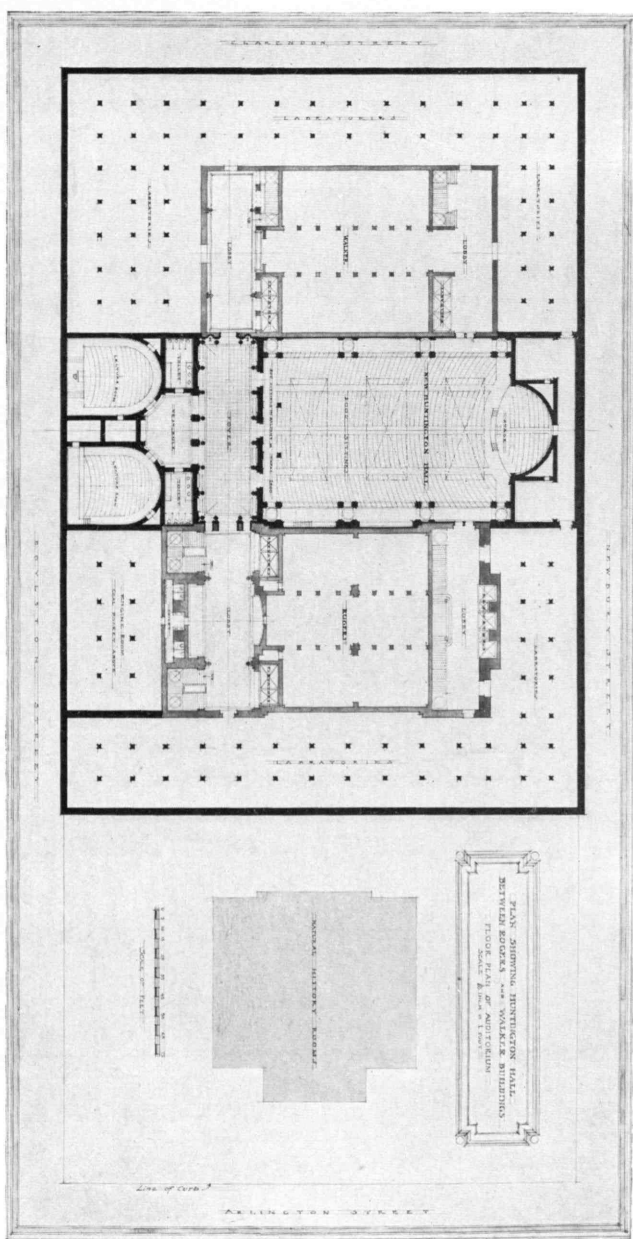
As a summary may be more convincing, we repeat:—

Rogers and Walker Buildings now net	105,898 sq. ft.
Engineering Building "A," Engineering Building "B," and Pierce Building now net	98,861 " "
Augustus Lowell Laboratory now nets	35,000 " "
Engineering Building, "C" now nets	19,000 " "
Boiler-room, carpenter shop, etc., now net	5,000 " "
A total of	263,759 sq. ft.

By rebuilding as outlined, the total areas would be:—

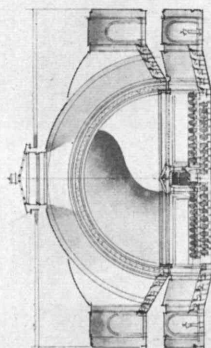
On Boylston Street	539,135 sq. ft.
On Trinity Place	570,250 " "
A total of	1,109,385 sq. ft.

Something more than four times the present total areas and an increase of 845,626 sq. ft., or 3.2 times the present areas in all the existing buildings.

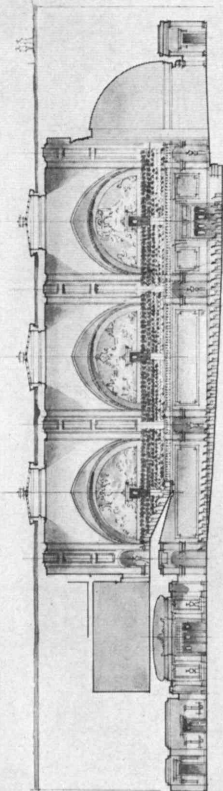


SECTIONS SHOWING HUNTINGTON HALL
BETWEEN ROGERS AND WALKER BUILDINGS

SCALE $\frac{1}{8}$ INCH = 1 FOOT



TRANSVERSE SECTION



LONGITUDINAL SECTION

Plan for a Larger Utilization of Property 169

The preceding shows the ultimate limits of floor space which present-day engineering practice place within our reach without the purchase of additional land, and without contravening either municipal or economic laws, and suggests the use that large mercantile houses would make of our property if they were fortunate enough to own it. The methods by which these deep basements can be built are very fully described by Mr. John M. Ewen in a paper on "Foundations in Chicago," read before the Western Society of Engineers, and published in the December, 1905, issue of their *Journal*, Vol. X., No. 6. Mr. Ewen's paper also tells how greedily the business houses have availed themselves of the extra floor spaces made possible by the new methods, and should remove all doubts from our minds of the entire practicability of the scheme proposed.

The remaining problem—the question of "advisability"—is still before us. Some will object that underground laboratories would be unsanitary, that the absence of sunlight and fresh air would create a prejudice against us, and keep many away. But have such objectors seen present conditions? and do they appreciate how little daylight and direct outside air can be found in any large shop of more than two stories in height? Yet is there not in such shops greater uniformity in ventilation and in temperature than formerly obtained in small isolated buildings? Moreover, in all modern theatres and lecture halls daylight is wholly excluded, so that the lighting may be under the control of the management; yet, from the point of view of sanitation, these are more nearly perfect than ever before.

As a first step in the direction suggested, sketches are presented for a new Huntington Hall to be built between Rogers and Walker Buildings below the present street level. Approaches to this hall would be managed through slight alterations in Rogers and Walker Buildings, and also by sunken courts and stairways in the restricted park area. The removal of the hall from Rogers Building would release a large space which could be subdivided as seemed most desirable. A study of the entrance pavilion which Rogers Building might show on Boylston Street, if rebuilt on lines suggested

by the above considerations, is also presented, and further studies along these lines are being prepared.

Let us build a new home, expressive of unconquerable spirit, and let us make it a concrete example to the world of true knowledge rightly applied, and, instead of seeking new land to build upon, let us develop with our engineers and architects that which is already ours.

THEODORE H. SKINNER, '92.

THE FEDERAL POLYTECHNIC AT ZÜRICH FROM AN ADMINISTRATIVE STANDPOINT

The following notes are based on the official publications of the Polytechnic, supplemented by personal observation and conference with members of its Faculty. The writer is much indebted to their courtesy, and particularly to the patience with which they received and answered numerous questions. No attempt was made to gain any acquaintance with equipment or the general methods and subject-matter of instruction, the object being to acquire a correct general understanding of organization and administrative methods, and of relations with the local university, and some notion of points of resemblance to or difference from American technological schools.

ORGANIZATION AND ADMINISTRATION

The Federal Polytechnic is designed to serve the needs of all Switzerland for technological education. The Federal Council (*Bundesrat*) is accordingly the ultimate authority, electing the School Council and its President and Vice-President. Its jurisdiction includes also:—

- electing (or removing) professors and teachers and fixing their salaries,
- granting leaves of absence and retirement allowances,
- presenting the budget of the school to the Federal Legislature,
- determining the acceptance of gifts and bequests.

These (and certain other) functions are exercised in general at the instance of the School Council, with the intervention of the head of the Department of the Interior, who has a voice in all meetings of the School Council.

The School Council (*Schulrat*) is the active governing body, and its President is the executive head of the institution. It has the initiative in matters above mentioned as determined by the Federal Council; it elects the Director and his substitute, and other ad-

ministrative officers, except heads of departments, whom it has the right to confirm. (Its former right to elect these has been yielded to the professors.) It fixes salaries within the limits of budget set by the Federal Council, grants leaves of absence on occasion, appoints or removes teachers (*Privat Dozenten*), apportions aid to students, determines laboratory and other fees, exercises oversight over the collections, reports annually to the Federal Council.

Besides these functions it has also the following powers and duties, although its exercise of them is, to a considerable extent, merely confirmatory:—

- the approval of the semester programmes;
- the determination of the school calendar and of the hours of exercises;
- action on the more serious cases of discipline, either on appeal or in original jurisdiction;
- the approval of the outlines of particular courses presented by the departments;
- the decision as to diplomas and prizes (the Polytechnic has not yet the right to give degrees, but expects to receive it soon);
- the decision as to admission of students;
- any other needful functions not specially prescribed.

In the discharge of these functions it is obliged to secure the advice of the Faculty (*Gesamtkonferenz*) or of the Department (*Spezialkonferenz*) on matters of importance. It—or its President—may enter into direct relations with any department or teacher.

The President (*Präsident*) must reside at Zürich. The other members are likely to live in different cantons. The President presents written recommendations, but any other member may also present business by motion. The President supervises the progress of the institution and its work, and is responsible for the carrying out of the decisions of the Federal Council and the School Council. In the intervals of sessions of the latter the President may deal with

- applications for admission,
- urgent cases of discipline,
- urgent cases of leave of absence and substitution,
- applications for remission of fees.

The Director (*Direktor*) and his substitute are elected by the School Council on the (double) nomination of the Faculty for a term of two years, with eligibility for not more than six consecutive years. He attends sessions of the School Council, except as otherwise ordered, and his principal functions are:—

- to carry out decisions of the Faculty;
- to exercise general oversight, acting as a co-ordinating and reporting agent between the School Council, the Faculty, and the Departments;
- to present to the School Council the programmes based on data furnished by the Departments;
- to co-operate with the President in deciding on questions of admission;
- to keep records and lists;
- to notify students and parents of action;
- to arrange diploma examinations;
- to deal with applications for change of department or leave of absence, with simple cases of discipline.

The Heads of Departments (*Vorstände*) are elected for two-year terms, with eligibility for not more than six consecutive years. Their duties include:—

- execution of departmental decisions,
- supervision of instruction and of students as to work and conduct,
- participation in questions of admission,
- decision as to substitution of studies or change of department.

The Faculty (*Gesamtkonferenz*) consists of all professors and teachers, the professors alone constituting a special division for nominating the Director and Vice-Director, etc. The Director presides, and must call at least one session a year. It is the duty of the Faculty to watch over the general development of the institution, and, in particular, to strive to keep all branches of its work in the closest and most vital relations with the chief aim of a practical and liberal education. The Faculty:—

- appoints its Secretary and Committees;
- discusses propositions of the School Council, the Director, the Departmental Conferences, and of its own members;
- deals with cases of discipline of a general character.

The Departmental Conferences (*Abteilungskonferenzen*) include for each of the eight Departments (see page 178) all officers of instruction, only the professors, however, having unrestricted right to vote.

The corresponding Departmental Conferences choose their own heads, as above stated, subject to confirmation by the School Council. Their functions include:

- the collection of quarterly reports of standing,
- the yearly promotion of students,
- simple cases of discipline,
- recommendations to the School Council as to curriculum,
- subject-matter of courses,
- the award of diplomas and prizes,
- recommendations in regard to more serious cases of discipline.

The Conference of Heads of Departments may be convened by the President or the Director, or on request of any three members. It is charged with the duty of insuring the harmonious and well co-ordinated execution of the regulations and conclusions of the authorities (Federal Council and School Council) in all Departments. It may discuss, in a preliminary way, matters falling within the province of the other Conferences (Faculty or Departmental) without, however, impairing their authority.

REMARKS ON ORGANIZATION

The test of any organization lies solely in its practical efficiency during a sufficiently long period, and such efficiency must depend on the adaptation of the organization to local conditions, the flexibility with which it meets new conditions, and the wisdom and good will with which it is administered. On these fundamental matters a brief visit affords no basis for judgment. Subject to this important reservation, the writer's impressions of the organization in the abstract were somewhat as follows:—

An element of fundamental and essential complexity is the mixed racial composition of the Swiss Republic. German elements preponderate, but French and Italian must always be reckoned with; and this necessarily implies more than the obvious linguistic difficulties. Again, any *federal* institution must be influenced by mere

considerations of locality; for example, in the choice of members of the federal School Council.

The functions of the Federal Council seem, from an American standpoint, to trench somewhat on the proper authority of a special board of trustees, as the School Council, selected for educational administration. The President and Trustees of an American State University would, for example, present to the legislature not a budget, but only a request for a general appropriation, and in particular cases for new buildings. The difference is, however, more apparent than real, the Federal Council actually leaving the authority substantially to the School Council,—a safeguard of which the value may well be different in different countries.

The keystone of the whole organization is evidently the School Council, controlling the conduct of the school on the one hand and connecting it with the body politic on the other. Of the seven members of the School Council for 1904-05 the President and Vice-President and one other live in Zürich, one in Lucerne, one in Berne, one in Lausanne, one in Aarau. This dispersion of the members naturally militates against frequent meetings or intimate knowledge of the school on the part of its members.

It would therefore appear, as in the case of the Federal Council, that the successful discharge of many of the functions of the School Council must depend on the extent to which it practically delegates them to its President or to other agencies responsible to it. In other words, the nominal powers of each Council tend to be exercised by a subordinate body or bodies. Such conditions are not, of course, unfamiliar elsewhere. If it were a question of the delimitation of powers actually and fully exercised, it would seem that the School Council might concern itself less with the details of educational and disciplinary routine than a literal interpretation of the regulations would imply.

The President's duties and powers appear to correspond somewhat closely with those of the corresponding officer in America. On the other hand, the most striking distinction from American usage seems to be the relative insignificance of the *Gesamtkonferenz*, the nearest analogue of our Faculty. In Zurich the several Depart-

ments appear to have much larger initiative and autonomy than would generally be the case in America. This corresponds with the fact that the students enter with more extensive attainments, and that their work at the Polytechnic is, therefore, more specialized by Departments from the beginning. It has the advantage of simplicity and directness, each Department dealing merely with its own students. From an American standpoint these advantages might seem to be somewhat dearly purchased at the apparent cost of the closer co-ordination and healthful interaction gained by leaving similar initiative to the Departments, but reserving the actual decision—for example, in such matters as recommendation for degrees, change of curriculum, etc.—to the Faculty as a whole. In America, however, the common degree (S.B.) in all departments, the identical duration (four years) of all courses leading to it, and the generally greater emphasis on this uniformity have a bearing on the matter. In Zürich there is a logical acceptance of the principle of nonconformity among Departments, some of them requiring only four or five semesters against the seven or eight of others. So far as the writer learned, there was general satisfaction with the existing degree of detachment of Departments, and no disposition to desire increased co-ordination or centralization.

Another conspicuous contrast with American conditions is found in the election for limited periods of the Director and the Heads of Departments. In comparison with the system of appointment for indefinite terms this seems more democratic, and the resulting identification of administrative with teaching functions, as well as the distribution of the former among a larger number of professors, have obvious advantages. How far these may be offset by the loss of continuity the writer could not judge. The provision permitting re-election up to a total period of six years was said to be generally exercised. The plan would appear to be in line with the non-centralization referred to in connection with the separateness of departments, and may have some tendency to increase the relative authority of those administrative officers having unlimited tenure,—the President and Secretary of the School Council, on the one hand, the staff of the Director, on the other.

RELATIONS WITH THE UNIVERSITY

The Polytechnic was founded by the Swiss Republic in 1855, and in connection with its location in Zürich the canton undertook to house it with the cantonal university already existing. Accordingly, the fine and extensive main building is still shared by the two institutions, certain collections are used by both, and certain professors give instruction in both. This connection—evidently neither close, nor organic, nor fundamental—tends to diminish as time passes, and would probably have been terminated long since but for the complications due to the original ownership of the entire main building by the canton. A separation such as is now contemplated must apparently mean the purchase of the remaining cantonal part of this building by the Confederation. It may be added that both institutions now have other buildings in which there is nowhere such association.

The Polytechnic not having at present the right to confer degrees, an arrangement exists by which the University confers its Ph.D. on candidates recommended by the Polytechnic. A thesis must, however, be presented in each case for approval by the Faculty of the University.

REQUIREMENTS FOR ADMISSION

As a state school, the Polytechnic adjusts its admission requirements to the possible performance of the secondary schools preparing its students. The delegates of the federal School Council—usually with one professor—attend the final examinations of the school, and acceptance of its certificates for admission is a matter of special agreement. The relations with these schools were said to be effective and mutually advantageous. The age requirement is eighteen, and the actual average is about nineteen.

On the presentation of a candidate's credentials the President decides, on recommendation of the Director, whether he shall be admitted subject to or without examination. Candidates who have failed at their certificate examinations in accredited schools are not admitted immediately to the Polytechnic examinations. Exceptionally mature age receives consideration as a claim to admission.

The examination is divided into a first part—general subjects—and a second—mathematics, physics, and chemistry.

The examining board (*Prüfungskommission*) consist of:—

the President and at least one member of the School Council,
the Director,
all the heads of Departments,
examiners selected from the instructing staff for two years each
by the School Council.

The Heads of Departments have a vote only as to the admission of candidates for their respective Departments.

REQUIREMENTS IN GENERAL EDUCATION

1. The candidate is required to write a composition showing his ability to handle correctly some subject with which he is acquainted as to orthography, style, and logic, in German, French, Italian, or English.
2. He must show by oral examinations his practical command of the languages—German, and in certain cases French—in which obligatory instruction will be given.
3. He is examined orally in

History of Literature,—German, French, Italian, English, or Ancient.

Political History (General, and for native candidates Swiss History and Constitution).

Natural Sciences,—Fundamental facts of the animal, vegetable, and mineral kingdoms, including the structure and functions of the human body.

REQUIREMENTS IN PROFESSIONAL SUBJECTS

1. *Arithmetic and Algebra*, including, for example, logarithms, continued fractions, binomial theorem, simple exponential equations, exponential, logarithmic, and the simpler trigonometric series.
2. *Geometry*, plane and solid, including transversals, construction problems, determination of volumes and surfaces.
plane trigonometry and the elements of spherical.
analytic geometry, including the simplest equations of the conics and the elements of solid analytic geometry.

3. *Descriptive Geometry.*
4. *Physics.*
5. *Chemistry.*
6. *Drawing, Freehand and Mechanical.*

The great majority of the Swiss students come from the non-classical secondary schools.

CURRICULUM

The general scope of the curriculum is determined by the Federal Council, to which, for example, the introduction of a new department must be submitted by the School Council for approval. The law of July, 1899, designates the following departments:—

- I. Architecture (*Hochbau, Architekten Schule*).
- II. Civil Engineering (*Strassen,-Eisenbahn,-Wasser-, und Brückenbau, sowie Vermessungswesen; Ingenieur-Schule*).
- III. Mechanical Engineering (*Industrielle Mechanik; mechanisch-technische Schule*).
- IV. Technical Chemistry (*Industrielle Chemie; chemisch-technische Schule*).
 - a. Technical Section.
 - b. Pharmaceutical Section.
- V. Agriculture and Forestry (*Land- und Forstwirtschaft*).
 - Forestry.
 - Agriculture.
 - Rural Engineering (*Kultur Ingenieur-Schule*).
- VI. Department for Teachers of Science (*Bildung von Fachlehrern in mathematischer und naturwissenschaftlicher Richtung*).
 - a. Mathematical-Physical Section.
 - b. Natural Science Section.
- VII. General Department (*Allgemeine philosophische und staatswirtschaftliche Abteilung; Freifächer*).
- VIII. Military Department (*Militärwissenschaftliche Abteilung*).

Subjects not required in any of the first six—the professional departments—are grouped in the seventh.

It is required that in all Departments instruction shall be given with constant regard to the special needs of Switzerland.

The prescribed vacation periods amount to thirteen weeks, eight in August and September, two at Christmas, three in the spring.

The number of semesters required in different courses is as follows:

Architecture, Civil and Mechanical Engineering, require seven semesters and an eighth for a thesis; Technical Chemistry, seven; Pharmaceutical Chemistry, four; Forestry, six; Agriculture, five and a sixth for a thesis; Rural Engineering five; Mathematical and Physical Science eight; Natural Science, six or eight.

An inspection of the programmes show that the Polytechnic concerns itself with the professional, and not with the general education of its students. This statement may be qualified, however, by the remark that a great variety of general subjects are offered as electives, and that students are required to take one or more of these in later years. Moreover, the previous general education represented by the entrance requirements is considerably more extensive than is the case in the United States. Nevertheless, it would seem at least possible that students entering the Polytechnic at about nineteen might advantageously be subjected to some further prescription in general studies. Such subjects as mathematics, descriptive geometry, mechanics, are naturally given to students of different departments together. On the other hand, the importance of division and differentiation of the instruction in physics was emphasized. Students in architecture and chemistry have an abridged course in mathematics.

In the first semester of the two engineering courses differential calculus is a common subject, with 4 hours per week of lecture, 3 of section work (*Repetitorium*, 1; *Uebung*, 2). At the same time analytic geometry has 4 hours per week of lecture and 1 of section work, descriptive geometry 4 hours of lecture and 5 of exercise. In the second semester integral calculus occupies 7 hours per week, mechanics 9; in the third, differential equations 5, mechanics 7, physics 5; in the fourth, physics 5. Business law appears in the later semesters of all programmes, political economy in several.

The course in Rural Engineering (5 semesters), a subdivision of that in Agriculture and Forestry, differs very little in the first semester from the course in Civil Engineering. In the second semester it

omits descriptive geometry and mechanics, and includes physics, surveying, roads, and canals. In the third it omits differential equations, mechanics, graphical statics, and theory of machines, and includes surveying roads and canals, meteorology, etc., the two thus ceasing to have any considerable resemblance.

The two courses for Teachers of Science, one in mathematical and physical science, the other in natural science, are not definitely laid out, but each student may work out his own programme in consultation with the head of his course. Seminar work in mathematics and physics is offered in the latter half of the four-year course. In the first year the programme of the mathematical physical course corresponds rather closely with the engineering courses. The course in natural sciences includes a large proportion of chemistry, but more mathematics than the course in technical chemistry, as well as other branches of natural and physical science.

In all the programmes examined the total number of hours per week seemed large, this being explained in part by the length of the day,—7 to 12 and 2 to 7 in the summer, 8 to 12 and 2 to 7 in the winter. The extreme hours are naturally used relatively little, but teachers and students must obviously live near at hand. There is marked concentration of time in principal subjects, and this is further notable in the time-table, where time is used in large blocks, even lectures often occupying two consecutive hours; *i.e.*, ninety minutes.

The number of subjects per semester in the four principal courses, as shown in the following table, ranged from five to nine in the first three semesters, from six to fourteen in the last four. The average is six in the former period, ten in the latter. The assignment of time for exercises varies from twenty-nine hours in the first semester of Mechanical Engineering to not less than sixty in the fifth semester of Technical Chemistry.

	Number of Subjects by Semesters.							Number of Hours per Week by Semesters.						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Architecture	8	7	9	10	8	10	7	41	38	46	51	39	48	34
Civil Engineering	6	6	6	6	9	9	14	33	38	34	40	43	42	40
Mechanical Engineering . . .	5	5	6	8	9	11	14	29	31	36	39	41	44	46
Technical Chemistry	5	5	8	6	13	12	7	42	39	42	32	60	54	39

Courses of but one or two hours per week are common only among the non-technical subjects.

The use of lectures and the dependence on the students' own notes seemed to the writer to be carried—as elsewhere in Europe—beyond the point of best economy; but observations on this point were limited. Text-books and printed notes have their inevitable defects, but the working out of satisfactory notes by the student consumes much time, and its value may be easily overrated.

Research seems to be highly esteemed and effectively practised in the various departments.

TEACHERS

The grades of the instructing staff are

Professor,
Associate (*Hilfslehrer*),
Privat Dozent (usually confined to elective subjects),
Assistant.

Teachers are required to give announced courses for three or more hearers, or even for one in the case of required subjects. Each must present the titles of his required courses to the Director's office, from which the collected material is referred to the heads of Departments for the approval of the departmental conferences. A teacher must report to the Director any detention from an exercise, and, if detained more than three days, must apply to the School Council for leave of absence. A teacher appointed for life—which appears, not to be frequently the case—who becomes disabled by age or illness may be retired by the Federal Council at the instance of the School Council, receiving a proportion (not fixed) of his salary. Removal requires similar procedure.

Directors and Heads of Departments are required to render an exact account of the finances and condition of their collections and equipment annually.

For the first semester of 1904-05 the total number of subjects announced is 405, counting recitations (*Repetitorien*) separately, including 58 by 31 *Privat Dozenten*. The number of professors is 78, of Assistants 62 (including 4 places not filled).

The writer found keen interest on the part of the professors in the sabbatical year plan which he was supposed to exemplify, but was obliged to confess that only the strongest American institutions had yet been able to establish it.

STUDENTS

Students may be Regular Students or Auditors (*Zuhörer*), something between our special students and "listeners." The former are required to follow one of the more or less definitely prescribed programmes, except as permission for substitution of subjects may be approved for special reasons by the heads of their Departments. A considerable amount of election is allowed after the first two years. Every regular student must take at least one of the elective subjects in each semester. The tuition fee is 150 francs, besides small fees for the library, the hospital, and accident insurance. Laboratory fees are also additional.

Auditors may attend the elective courses subject to the age requirement and to presenting a certificate of character. Admission to professional subjects, however, requires examination or equivalent certificates, except in the case of men of mature age engaged in technical pursuits. Poor and able students may receive pecuniary aid, in addition to the remission of tuition. In disciplinary matters students are subject to general police regulations, and may be specially dealt with by the officers of the Polytechnic for:

neglect of studies,
disrespect and disobedience towards the school authorities and teachers,
disturbances and duels.

Penalties include:

reprimands by the Head of the Department, the Director, the President, or the School Council,
probation,
cancellation of registration,
dismissal. The last is determined by the School Council, and

is posted. It is the usual punishment for participation in a duel.

The by-laws of student societies and list of members are subject to inspection.

A student's promotion at the end of the year is determined by the departmental conferences on the basis of his work for the year. Two successive failures result in dismissal.

The diploma is an earned distinction. The School Council directs the oral examination, which is public, and is divided into two parts, of which the first is taken at the beginning of the fifth semester (in the Departments which have been above discussed). The examining committee consists of the Head of the Department and the examiners. A rank is given in each examination subject, and a definite weight is applied in each. Excellent previous work receives consideration. Success with the preliminary examination is required for admission to the final, and the results of both are considered in the award of diplomas. The examining committee reports for both to the School Council, including details and possible expressions of dissent. In particular cases, diplomas are "with distinction." Either examination may be repeated after a year's interval.

A thesis (*Diplomarbeit*) is an essential accompaniment of the final examination. In the department of architecture there are 5 preliminary examination subjects, 7 final, and the thesis is equivalent in weight to 7 examinations. In civil engineering there are 6 preliminary subjects, of which 4 have double weight, 7 final. The thesis has weight, 3 or 4. In mechanical engineering there are 6 preliminary subjects, of which 3 have double weight, 6 final, including 4 double, the thesis counting as 3, etc. About 80 per cent. of the regular students apply for the preliminary examinations, about three-fourths of these passing, and about one-half receiving diplomas.

A professor having some acquaintance with American institutions expressed the opinion that these directed their work and attention relatively more to the weaker students, and, in general, occupied themselves more with the personal welfare of students.

STATISTICS FOR 1903-04

REGULAR STUDENTS

	<i>Swiss.</i>	<i>Foreign.</i>	<i>Total.</i>
Architecture	53	8	61
Civil Engineering	213	70	283
Mechanical Engineering	271	251	522
Chemistry:			
(a) Technical	136	101	237
(b) Pharmaceutical	3	1	4
Forestry	30		30
Agriculture	43	8	51
Rural Engineering	17	5	22
Teachers:			
Mathematical-Physical	19	5	24
Natural Science	22	7	29
	807	456	1,263
Hearers registered			657
			1,920

Of the foreign students, 113 came from Austro-Hungary, 59 from Russia, 56 from Italy, 40 from Germany, 33 from Holland, 28 from France, 26 from Roumania, 22 from Great Britain, 14 from America (North and South), etc. It is an eloquent testimony to the wise liberality of the Swiss Republic—neither great nor wealthy in comparison with many of these countries—that it furnishes so admirable an education to all comers at a nominal cost, with no thought of discrimination or direct return.

H. W. TYLER, '84.

THE TECHNOLOGY FUND

ADDRESS OF MR. F. P. FISH

A well-attended meeting of Technology Fund workers was held at the Trade Club, Boston, on March 29, 1906. The meeting was addressed by Mr. Everett Morss, Mr. Frederick P. Fish, of the Corporation and Executive Committee, Mr. C. A. Stone, and others, and the progress of the campaign and the effect of the fund on the Institute were thoroughly discussed.

Mr. Fish spoke in part as follows:—

To deal with the fundamental purposes of your meeting, I could not do better than to repeat your President's speech. It covered the ground so well that nothing can advantageously be added to it. I should like to say a word, however, on the general subject of education, for I cannot help feeling that at the present time the underlying problems of education must be taken into account in connection with every phase of the work of the Massachusetts Institute of Technology. If we could be sure that we properly appreciated what the Institute must do, the lines upon which it should be developed, and the character of the training that it should seek to give, we should be in a far better position in our efforts to advance its material prosperity, and not only to state our case to the other graduates whom you are to approach, but also to deal with the subject adequately in the appeals which we must make to those on the outside who are in a position to give the assistance that is required, and who must be led to realize the importance of the Institute as an educational force in this country. We must not forget that the graduates alone cannot carry the whole burden. We must all put our shoulders to the work, and strive for help from the outside.

In the little that I have to say on the subject of education generally, I am not asking you to agree with me in any or all of my views. The most that I hope to do is to stimulate you to think for your-

selves, to find out for yourselves what is the truth, what is the proper view to be taken, the proper line upon which to work. It is only by suggestion and discussion that the right ideas can be developed. If we are all seeking for them, we shall find them. It is well that the seeking as well as the finding should be disseminated throughout the community; and I hope that the community of the Institute is this whole great country of ours.

There has not been a time in the last three thousand years when there was so much uncertainty in the minds of men as to theories of education as seems to me to be the case to-day. There was no doubt on the subject in the time of the old Persians. They thought it sufficient to teach their boys "to ride, to shoot, and to speak the truth,"—a pretty good education for those times. We all know something of the Greek ideals, which aimed at a perfection of mind and body which has not, I regret to say, always resulted from the schooling of more modern times. There was no doubt in the minds of the Greeks as to how their young men should be educated, and so down through the period of the schoolmen to the universities of modern times there was developed in each country and in each period a scheme of education that, as I look at it, seemed to the people of the day, in substance, the correct and final scheme. In this country the collegiate education of the period up to fifty years ago was accepted without much question as surely the best and most satisfactory that could be devised.

It has only been during the memory of men now living, since the great development of the physical sciences and since we have been brought face to face with the extraordinary industrial conditions which characterize our time,—so unlike anything that ever existed before,—that there has become a marked element of uncertainty in our ideas of education, leading to serious question as to whether a radical improvement in methods is not merely possible, but desirable and necessary. To-day it seems to me that we are, to a certain extent, groping,—dissatisfied with the systems of the past and of the present and hopeful for the future, but to a large extent uncertain as to the way in which our educational work should be so shaped that its results may be most effective.

We all know something of the ideas and methods that the Germans have developed in their universities and technical schools. We know of the conservatism of the English universities. When we note the high standard, as men, of those who are educated in Germany, and the equally high standard of those who come from the English universities, we may well hesitate to determine which country has adopted the sounder theories and the more effective methods. In this country we are wavering. There are many of us who believe in the old-fashioned academic schooling, with its range of studies somewhat remote from practical affairs, and there are others who advocate a more modern plan, which differs from the earlier in the emphasis given to engineering, technical, or scientific studies.

What is fundamentally new in the more modern schemes of education cannot be even adequately stated in the short time at my disposal; but, generally speaking, is not the difference between the old scheme of education and the new based upon two different views of the function of education, which, while not necessarily inconsistent with each other, result, in practice, in different lines of work?

In the old days it was the commonly and generally accepted idea that the purpose of an educational institution was to take a boy at the age when he was developing from youth to manhood, and to carry him along under proper discipline so as to make a sound man of him, giving him broad, underlying principles of thought and action that would fit him for the duties of life in any or all of the fields open to an educated man. The Persian thought that for his time and his environment a man who had been thoroughly trained "to ride, to shoot, and to speak the truth," and who had really profited by that training, had, as a result of this education, become as well able to deal with the comparatively simple problems of Persian life as could possibly be the case. Such was the thought of the Greeks and of the peoples of the Middle Ages and later, all of whom believed that they had found a system of education that would build up a man so as to enable him to be of the utmost value to himself and to the community of which he was a part. Not only useful men, but great men, were developed by all these systems of education;

and the validity and truth of the fundamental thought seemed to be established in every generation by the result of the schooling. The ideals of this older education were noble and honorable and wise, I believe, to the last degree. We have not lost those ideals, and we must never lose them. We men of to-day, in dealing with educational questions, must always first consider the type and kind of man that is turned out from an institution as the great test of its efficiency and of the soundness of its methods; but there has come into the world as an actual practical force the new thought that not only may education result in fitting a man generally for the world's work, but that as an incident to his education he may be trained in such a way that, when he has finished with his schooling, and has gone out to seek his fortune and to play his part in practical life, he shall have such an actual knowledge in certain special directions as to be directly useful in certain fields for which his training directly fitted him. It may almost be said that in the old days the higher education was *directly* of practical value only to a school-teacher or student or professor, who gave up his life to work analogous to that preliminary work which occupied his attention in the university. But, in so far as that education was sound, it was expected to train the student so that he might become an engineer, a professional man, or a business man, and be stronger in ability and character than would have been the case if he had not had the benefit of the standard education. The more modern thought, as it may be called, supplements this idea by adding to it the principle that his education may be such as to produce a man of just as sound intellect and character and of just as high standards and attainments, and with the same capacity for excellent all-around work in whatever lines he may find himself employed; while, at the same time, and as a result of the same education, he may be acquainted with definite and more practical affairs, so as to be immediately ready for work and immediately fitted for the actual performance of it, without so much of the supplementary training that was required in the older days. It seems to me that one of the difficulties that educators have to deal with, one that must never be overlooked by the Corporation of the Institute or its Faculty, one of the difficulties that you graduates of

the Institute have to consider and solve, is to determine exactly how much truth there is in this new thought, if it is new, and exactly the limitations involved in it. No scheme of education can be satisfactory that does not develop in the case of each man the best that is in him. None can be tolerated that does not produce men of character and attainments, able to grapple with the great, general questions that are sure to be met in life. Whether students can be educated along the practical lines which fit them for immediate service in the world, without undue sacrifice in the general results which are of such importance, and, if so, whether in a particular case, as, for example, in the case of the Massachusetts Institute of Technology, there is any error in the scheme or method which must be eliminated, in order that the results may be altogether satisfactory instead of only partially satisfactory, is one of the great questions which we all must consider.

It is my own personal belief that the work of the Institute of Technology can be so shaped as admirably to train men to become engineers and technical men, who are of immediate value in their special professions, without in any substantial degree interfering with that intellectual and moral development which is necessary to make them strong, able, and effective workers in the field at large. I believe that, when properly guided, men can grow in general character and strength, through the study of physical science and the practical applications of the principles of the laws of physical science, to substantially the same extent as if a larger portion of their education had been in what were once called the humanities. The soundly educated man of the old type may be somewhat different. He may look at things in a different way and from a different point of view; but, for all that we can foresee, the normal result of the newer form of education, when worked out on right lines, may be even a better, a more useful, and a more satisfactory type.

In my opinion the great problem for the Institute is to organize its work so that there will be no loss in the general fitness of the product that is not more than compensated for by the capacity for practical work attained by the years spent in the school. As I have

already stated, it seems to me that at this day we are facing such new problems in education that our undertaking is even now, to a certain extent, experimental. No one would venture to say that he knows it all; that he is in a position to define exactly the lines upon which the work of the Institute should be carried on, in order to accomplish the best and most satisfactory result. We must all deal with the question, and study it, each from his own point of view; for, while the subject is pre-eminently one for a specialist, there can be no true specialist in education who has not studied and learned the point of view of every intelligent portion of the community. We must all aid the specialists in coming to a sound conclusion.

And what a fascinating piece of work it is! If I could live my life over again, I would prefer nothing to the life of an educator, devoting my entire time to the study of these questions; for what career could be more interesting or of greater moment than one devoted to finding out how to train those who are to be the bone, the sinew and the blood of the great corporate body of the United States of America? We must do everything in our power to make the Institute of the greatest possible weight in the community. We must co-operate to see that it is developed upon absolutely sound and adequate lines. To this end, the first and most important thing is that the Corporation, the Faculty, and the graduates should pull absolutely together in determining, first, the fundamental principles and, next, the way in which those principles should be developed and applied. I do not mean, nor do I for one moment suggest, that now or at any other time we shall all agree on these fundamental propositions; for I am satisfied that a universal agreement on such points might mean stagnation, and that the truth can come only from the correlation of sincere and honest but necessarily divergent views. It may, and probably can, come only after some mistaken ideas have been adopted and some mistaken methods employed; but, if we all keep at it, there will ultimately be found exactly what is required to attain for the Institute the position among educational institutions which it must have,—namely, a position which is pre-eminent.

The suggestion of the usefulness of honest disagreement reminds

me of this matter which is now absolutely dead, the matter of the so-called "merger." After giving that subject the best thought of which I was capable, I was firmly convinced that it was of the greatest importance to the Institute that it establish the close relation with Harvard University which was contemplated in the memorandum with which you are all so familiar. I have never seen any reason to change my belief. I know that many of you differed absolutely with me in that view. I never for a moment had any feeling that those of you whose opinion did not coincide with mine were not actuated by a zeal and devotion to the Institute equal to mine. I never undertook to measure the intelligence of those who were on the other side as compared with my own. I was convinced as to what was for the interest of the Institute. Those who differed with me had convictions the other way that were equally strong. To make one last and final reference to this matter, which I think ought now to be forgotten, I am satisfied that this difference of opinion, taken by and large and in the long run, was a great thing for the Institute. As a result of it, more thought has been given by all of us to the needs of the Institute, to its record in the past, to its prospects in the future. We have been waked up to the necessity of correcting that which needs correction, of finding out the fundamentals, as well as the details, of how we must work to develop the Institute on such lines as to continue it, under changing conditions, as the great, important instrument for good that it has been, and must always be. I doubt if in any other way we should all have been brought into more complete and absolute harmony in our devotion to the school and in our determination to see that everything necessary is done for its advancement. For these reasons I am satisfied that the discussion which we have had and the differences that have arisen among us, in so far as they were a disadvantage, were disadvantageous only for the moment, and that they will prove to have been fruitful in advantage for all time.

Let me refer for a moment to your efforts to raise funds for the enlargement and development of the work of the Institute. Your work has been admirable and effective. It is altogether creditable to you, and the results are creditable to the graduates. Even if

zeal and loyalty are to be assumed, as in the case of all associated with the Institute, it is a great thing to have them stimulated once in a while by active effort. There is nothing sordid in money, except when the man is sordid or the purpose is sordid. When we are dealing with the question of an educational institution that has so much influence in shaping the lives and careers of individual men, and in shaping through them the future of the community and of our country, the question of money is not only one of the utmost importance, but is one with which we may well be proud to deal. No institution of learning can thrive unless it is properly supported; and, if it is doing its duty, the demands of every such institution are greater from year to year, not only because of its growth, but because the constantly higher standard of work which it must have requires a larger and larger expenditure. All of us know that there is hardly a department of the Institute that is not to-day greatly in need of money,—not for luxuries, not for mere conveniences, but as an absolutely necessity for sound and extended work. It is almost pathetic to sit in the Executive Committee and hear the letters from this professor or that, telling how he is hampered because he cannot have \$50 or \$100 for his laboratory or for more assistants or for some apparatus that is needed to make his work effective. It is painful to learn how, not only the work, but the very life of the men is contracted for the lack of necessary funds. Much should be done to improve the general environment and condition of the students; and the Institute should be placed in a position where the judgment and sympathy with which it should deal with this problem need not be hampered by lack of resources. Well as the Institute is doing,—and it is doing very well,—we all see that there is much which is important and far-reaching for good that could be done if we had adequate funds. We must have larger resources. The Institute must go on increasing in power and efficiency, or there is danger, at least, that it may go backwards. There are two ways of getting the money which we need. One is to contribute it ourselves, and the other is to get it from outside our ranks. You have done a magnificent work in getting together the number of subscriptions which you have succeeded in getting. I am abso-

lutely sure that you have now got the snowball so large that it will grow and grow, until the fund amounts not to \$500,000, but to much more.

But the work you have done has been largely in the family. It may be bad policy to call upon outsiders at the present time. It seems to me clear, however, that every man associated with the Institute in any capacity, as student, member of the Faculty, member of the Corporation, or graduate, should remember that there are any number of men in this country ready to pour money into the coffers of the Institute, provided the right suggestion is made, at the proper psychological moment, to the man who has the money and who desires to invest it in the soundest possible way. There is money enough ready for the investment. There are men enough seeking to invest their surplus wealth in just such enterprises. They need only to be reached and satisfied as to the validity of the investment. They want instruction. They hesitate only because they fear they will make a mistake. If we all have it in mind that wherever we go or whomever we see, we should be constantly putting to ourselves the question, Is not this the opportunity to get the help which the Institute needs? sometime some of us will strike the right men, who will be glad to come forward with the large amounts needed in order to secure that development for the Institute which it must have.

One effect of the decision of the Supreme Court is that we must stay where we are for a long time to come. Our growth must be in the neighborhood of Berkeley, Clarendon, and Dartmouth Streets, where land is held at a high value. The number of dollars that ought to come to the Institute for land and buildings in the next twenty-five years is larger than I care to express. We need large sums for equipment and for an increase in the teaching force, not to speak of the question of adequate compensation for the teachers we now have and must have. All this money, I am sure, will come if the Institute shows itself worthy of the support of right-minded people. It will not be false to its history; but, to be true to its history, it must not for a moment stand still. Its standards must enlarge, and it must become each year stronger and more efficient.

Competition in educational institutions is as clear and definite an element, and to be taken into account as much, as competition in business; and, however the case may be in business, I am sure that in educational institutions competition is the life of the situation. Nothing can be more stimulating to an institution of high ideals than the prosperity of its competitors. No first-class man or first-class organization ever resents fair competition,—the competition of a foeman worthy of his steel. In its own field the Institute will have to measure itself for all time, not only against Cornell and the other older institutions, but against the State universities which are developing on sound lines all through the West, where everything that can be done by unlimited wealth and great enthusiasm and intelligence will be done to develop them into institutions of the highest class. We impose upon the Institute the duty of keeping to the front. It should be its ambition to stand in the United States as the great technical school of the first rank, and to be recognized by the State Universities of Kansas, Wisconsin, and California as the greatest of such schools.

As was the case when Themistocles was proved to be the only general fit to lead against the Persians at Salamis, we must shape our affairs so that, while each institution may loyally vote itself to be the first, they will all declare the Institute the second in the land.

If the Institute is to reach and maintain that position, it has much to do. It must not only hold its own, but it must forge ahead. It must by its constant development and continued growth in power and efficiency show itself worthy of the support of the community as a whole, as well as of those who are particularly interested in it. You gentlemen have already shown what you can do in a material way. You and your associates have, to a large extent, the responsibility for the future. If nothing will satisfy you except that the institution shall stand at the head of its class, there will it surely stand. You can and must be an inspiration to the Corporation and the Faculty, whose work will be enormously easier if they have your sympathy and active support, not merely encouraging them in the work they do, but spurring them on to constantly increasing efforts and higher ideals and higher achievements.

As to the money side, you hope to bring your efforts for this particular fund to a satisfactory conclusion this spring; but, when your Fund Committee dissolves, the obligation of the graduates, of the Corporation, of the Faculty, and of all the friends of the Institute to keep on, month by month and year by year, in the same spirit, to secure what the Institute needs, not to maintain its present position, but to grow and develop, will continue for all time; and, gentlemen, while the burden will be great, it will be one of the most delightful burdens that we can have on our shoulders. We shall be glad to carry it. We shall have moments of dissatisfaction and of discouragement, but we shall have periods of supreme pleasure, when things come our way faster than we have any right to expect and we see not only the material resources of the Institute, but its character and standards, advanced to our satisfaction. We must work for the two things, which are really one; and, as the Institute gains, and is recognized as the greatest school of its character in the country and in the world, it will be a never-ending source of pride to us that we have contributed by our thought and effort to its prosperity, and thereby to the advancement of our country and of the human race.

INSTITUTE GRADUATES AT GERMAN UNIVERSITIES

In July, 1904, the Philosophical Faculty of the University of Berlin adopted the following rules in regard to American students:—

1. The Faculty recognizes every baccalaureate degree (A.B., B.Sc., etc.) acquired at an American university as the equivalent of the German *testimonium maturitatis* [certificate of completion of the course of study at a German Gymnasium].

2. In order to have graduate work pursued at an American university credited by this Faculty, upon proper approval of the ministry, towards the three years of study prescribed by this University for the degree of Doctor of Philosophy, the candidate must have taken his graduate work at one of the institutions represented in the Association of American Universities. The candidate must, however, have been in residence at a German university for at least three semesters.

By this rule, which has also been adopted by many of the other important German universities, students who have pursued graduate work at the Institute or other scientific schools not connected with one of the fifteen universities belonging to the Association of American Universities are required to spend not less than three years, in order to obtain the degree of Doctor of Philosophy. Since experience has shown that our graduates, especially after they have devoted an extra year or two to graduate study or teaching at the Institute, are almost always able to complete the work required for the German degree in two years or less, this new regulation cuts off to a considerable extent Institute graduates from the advantages of German study which they have previously enjoyed, and it has already forced some of them who desired to study at German universities to go to those of other countries instead. It is felt by the Corporation and Faculty that this discrimination against men educated at scientific schools in this country is an unjust one, and that the

matter should therefore be brought forcibly to the attention of the proper German authorities. For this purpose a memorial is to be submitted to the Ministers of Education of the German States and to the Philosophical Faculties of the German Universities. It is believed that this is of so much interest as representing the claims of Institute graduates to the same recognition as is given to those of American universities that the REVIEW presents below the memorial substantially in the form in which it has been adopted by the Corporation and Faculty.

LETTER.

BOSTON, April 28, 1906.

TO THE PHILOSOPHICAL FACULTY OF THE UNIVERSITY OF BERLIN:

Dear Sirs,—The Corporation and Faculty of the Massachusetts Institute of Technology desire respectfully to submit to your honorable body information in regard to the character of the instruction and research pursued at this Institute and in regard to the preparation and fitness of its graduates to pursue advanced work at German universities, and to request that the graduates of the said Institutè be received at German universities under the same conditions and be granted the same privileges with respect to promotion for the degree of Doctor of Philosophy as are accorded to students holding degrees from American universities belonging to the Association of American Universities.

In justification of these requests it will be shown by the information and documents herewith submitted that the degree of Bachelor of Science of the Institute represents the completion of an amount of fundamental and cultural study no less than that required for the degree of Bachelor of Arts at some of the colleges belonging to the Association of American Universities, and a training on the scientific side far more thorough than is ordinarily received by Bachelors of Arts at such universities. It will also be shown that the Institute maintains courses of advanced study and research, and that the quality of its work as indicated by the records and reputation of its students and graduates is not inferior to that of the best American universities; also that non-membership in the "Association of American Universities" establishes no presumption unfavorable to the thorough and advanced character of the work of the Institute.

For greater convenience in its consideration the information referred to

Institute Graduates at German Universities 199

is presented in the form of a printed circular in the German language; and a number of copies of this circular are submitted herewith.

INFORMATION

With this circular are submitted certain publications of the Institute which will give information in regard to the character of its work. These include the latest Catalogue of the Institute, the President's Report for 1906, and circulars on Summer Reading, on Advanced Study and Research, and on the Research Laboratory of Physical Chemistry.

It will be seen by reference to page 99 of the Catalogue of the Institute that candidates for admission must pass examinations in history, English literature and composition, German, French, algebra, plane and solid geometry, and physics. Only students who have already attended other colleges are admitted without examination. The requirements for admission are in these subjects not less severe than those of the stronger American universities, and in mathematics the Institute tests are exceptionally thorough. Students entering the Institute have about the same average age * as those entering the universities, and they have had a substantially equivalent preparatory schooling.

By reference to pages 36-71 of the Catalogue it will be seen that each candidate for the degree pursues a four-year course of study in such a department of science or technology as he may select. The main studies of each Course are prescribed, but in the later years the student has the opportunity of choosing between several different lines of work. It will be seen that the first two years of each Course consist mainly of studies of a cultural (non-technical) or fundamental character, and that such studies are continued, though to a less extent, in the third year. Thus every candidate for the degree of the Institute pursues courses in English literature and composition, advanced German and French, American and European history, political economy, business law, general chemistry and physics, including laboratory work in these subjects, mathematics through the calculus, mechanical and free-hand drawing, and descriptive geometry. In addition each student must attend such one or two of the following courses as he may select:† English literature, advanced English composition, Spanish, advanced French or German, history of science, politics and

* The average age of students entering the Institute is 18.7 years.

† See page 72 of the Catalogue.

government, international law, economic history, or some special branch of economics; and he is required during the summer vacations to do extensive reading in literature, history, and general science.* These studies which every candidate for the degree of Bachelor of Science must pursue represent a considerably larger amount of work of a general educational character than is required for the corresponding degree at the scientific schools connected with the leading American universities.†

It is worthy of note that at such universities the number of students who now pursue mainly classical studies is a small percentage of the whole. Mention may also be made of the fact that at some of the leading American universities (for example, at Harvard, Columbia, and Johns Hopkins) the degree of Bachelor of Arts may now be taken in three years, while the courses for the Bachelor of Science degree at this Institute require a period of study of at least four years.

The scientific work required for the Institute's degree of Bachelor of Science in the Courses of Chemistry, Physics, and Electrochemistry, are shown on pages 51, 57, and 59 of the Catalogue. It will be seen that all the important branches of these related sciences are thoroughly treated in each Course, not only through lectures and recitations, but also by means of laboratory work of an exact quantitative kind in each subject. Every student is required to carry on in the second term of the fourth year an original investigation of some new scientific problem, and to describe the results of it in a "thesis" submitted to the Faculty. For the purpose of comparison with the work done in the same lines at American universities, the Institute's Course in Chemistry, which may be taken as a typical one, has been placed side by side in Appendix A with the corresponding courses given at the scientific schools of Harvard University, Cornell University, and Yale University. An examination of these schedules shows that the number and nature of the scientific and technical courses required for the degree at these three institutions are not far from the same,‡ but that, as stated above, this Institute requires a larger amount of cultural study.

* See the Summer Reading circular herewith enclosed.

† Thus the total number of hours devoted at the Institute to exercises in the above-named subjects (not including the Summer Reading) is 1,455; while the time required to be devoted to similar subjects in the course in chemistry at some other scientific schools is, according to their catalogues, as follows: at the Lawrence Scientific School of Harvard University, 1,185 hours; at the Sheffield Scientific School of Yale University, 840 hours; at the College of Arts and Sciences of Cornell University, 750 hours. (See Appendix A.)

‡ Except at the Sheffield Scientific School of Yale University, where the work for the degree is ordinarily completed in three years instead of four.

The Corporation and Faculty of the Institute are well aware that what is important in education is not so much the quantity of the work accomplished as its quality and the training acquired from it by the student. These are matters which can hardly be demonstrated by statistics. Yet attention may be called to the following facts bearing directly or indirectly upon the character of the instruction at this institution. The Institute maintains graduate courses leading to the degrees of Master of Science, Doctor of Philosophy, and Doctor of Engineering, as is done by the leading American universities. Research work is carried on in all its departments, and a special Research Laboratory of Physical Chemistry and one of Sanitary Science have been established for the purpose of promoting scientific investigations in these directions.* The members of its instructing staff publish each year a considerable number of original researches† in science and technology. Its graduates occupy some of the highest engineering, scientific, and professional positions in this country.‡ Of its present students thirteen per cent. have previously received the degree of Bachelor of Arts or of Science at some other institution, and in most cases at one of the colleges in the Association of American Universities. Finally, more than one-third of its fifteen hundred students come from States outside New England § or from foreign countries, showing that its reputation is not merely a local one.

That students of the Institute after receiving its degree of Bachelor of Science are in fact prepared to enter successfully upon more advanced study and research at German universities is perhaps shown most conclusively by the record of those Institute graduates who have studied in Germany. In Appendix C are presented statistics in regard to all such graduates who have taken the degree of Doctor of Philosophy at a European university. These show the main branches of science pursued, the usual period of study in Europe, the universities by which the degree has been granted, the ranks obtained (in so far as these were known to the compiler), and the character of the positions now occupied by most of the recipients of the degree. An examination of this appendix will show that with few exceptions Institute graduates have received the Ph.D. degree after a residence of only two years,

* See pages 84-92 of the Catalogue and the special circulars.

† See pages 94-103 of the President's Report for a list of publications made during the preceding year.

‡ See Appendix B.

§ That is, from distances exceeding 400 kilometres.

and generally with the rank of either *Summa cum laude* or *Magna cum laude*. It will be seen, moreover, that most of these men now occupy important professional positions.

Finally, it may not be superfluous to add that non-membership in the Association of American Universities establishes no presumption unfavorable to the Institute. The term university is applied in this country only to educational institutions of which a *college* giving the degree of Bachelor of *Arts* forms a part. The Institute does not give this degree, which as a rule represents an education on the humanistic rather than the scientific side; and it is therefore naturally not included in such an association. The Institute courses in scientific subjects are conducted, however, on a scholarly plane not inferior to that of the best American universities, and the exceptional earnestness and industry of its students and the efficiency of its graduates are recognized throughout the country.

In view of all these considerations the Corporation and Faculty of this Institute venture to express the hope that the highly esteemed privileges hitherto granted by many German universities to Institute graduates, of which privileges past experience seems to have shown them worthy, may not now be abridged by the adoption or continuance of regulations which make a discrimination between graduates from the leading colleges and those from the leading scientific schools of this country,—between the system of education based primarily upon humanistic and that based upon scientific studies.

APPENDIX A.

TYPICAL COURSES IN CHEMISTRY THAT WOULD FULFIL THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY, OF BACHELOR OF SCIENCE OR ARTS * AT HARVARD UNIVERSITY, OF BACHELOR OF ARTS AT CORNELL UNIVERSITY, AND OF BACHELOR OF PHILOSOPHY AT YALE UNIVERSITY.

<i>Subjects.</i>	<i>Hours of Required Class Work.</i>			
	<i>M. I. T.</i>	<i>Harvard.</i>	<i>Cornell.</i>	<i>Yale.</i>
Advanced Algebra	30	45	30†	30†
Plane Trigonometry	30	45	30†	30†
Analytic Geometry	45	45	75	60
Differential and Integral Calculus . .	90	90	75	30
Differential Equations	45	—	—	—
Advanced French	90	90	—	—
Advanced German	90	90	—	180
English Composition and Literature .	135	120	—	90
European and American History . . .	60	—	—	—
Political Economy	45	—	—	—
Other general studies	60	—	—	—
Descriptive Geometry and Drawing .	225	210	135	90
Physics, Lectures and Recitations . .	180	120	120	120
Physical Laboratory	75	150	150	—
Inorganic Chemistry, Lectures and Laboratory	255	180	135	120
<i>Fundamental & Cultural Subjects: Total</i>	<i>1,455</i>	<i>1,185</i>	<i>750</i>	<i>840</i>
Mineralogy	60	150	70	135
Geology or Zoölogy.	—	—	120	105
Mechanics of Engineering	—	—	150	—
Mechanical Laboratory	—	—	120	—
Thermodynamics	30	—	—	—
Military Science	90	—	90	15

* A considerably less amount of work than that shown in the table would fulfil the requirement for the degree of Bachelor of *Arts* at Harvard University.

† Required for entrance to the Scientific School.

<i>Subjects.</i>	<i>Hours of Required Class Work.</i>			
	<i>M. I. T.</i>	<i>Harvard.</i>	<i>Cornell.</i>	<i>Yale.</i>
Advanced Inorganic Chemistry . . .	30	—	30	120
Qualitative Analysis	165	300	200	285
Quantitative Analysis	615	450	290	445
Assaying	30	30	90	30
Special Analytical Methods	—	150	130	—
Water Analysis	30	—	140	—
Gas Analysis	20	150	90	15
Industrial Chemistry	90	90	—	—
Organic Chemistry Lectures	90	135	90	75
Organic Chemistry Laboratory. . . .	270	150	270	180
Theoretical Chemistry	75	60	90	45
Theoretical Chemistry Laboratory . .	90	150	90	—
Electrochemistry	30	45	45	—
Electrochemistry Laboratory.	90	150	150	—
History of Chemistry	15	45	—	—
Other elective subjects	—	—	90	—
Research and Research Reports . . .	300	400	300	—
<i>All Subjects:</i>	3,575	3,640	3,395	2,290

NOTE.—Owing to the complications introduced by elective studies and the divergence between stated hours of class-work and those practically required, this table probably does not represent an exact equivalent of the requirements of the different institutions; but it is thought to be sufficiently accurate to furnish a fair basis of comparison. The smaller total requirement at Yale University corresponds to the fact that the course for the Bachelor of Philosophy degree there is one of only three years.

APPENDIX B.

PRESENT POSITIONS OCCUPIED BY SOME GRADUATES OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY IN THE CLASSES OF 1868 TO 1899.

A table is here inserted substantially like that published in this REVIEW, Vol. VII., p. 421.

APPENDIX C.

STATISTICS CONCERNING GRADUATES OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY WHO HAVE TAKEN THE PH.D. DEGREE AT EUROPEAN UNIVERSITIES FROM 1888 TO 1905.

Total number of such graduates	29
Number who received rank of <i>Summa cum laude</i>	8
“ “ “ “ “ <i>Magna cum laude</i>	11
“ “ “ “ “ <i>Cum laude</i>	7
Number whose rank is unknown	3
Number who completed the work for the degree in 2 years	23
“ “ “ “ “ “ “ “ “ 2½ years	4
“ “ “ “ “ “ “ “ “ 3 years	2
Number whose major subject was chemistry	19
“ “ “ “ “ physics	7
“ “ “ “ “ mathematics	1
“ “ “ “ “ geology or biology	2
Number who received the degree at Leipzig	14
“ “ “ “ “ Göttingen	3
“ “ “ “ “ Heidelberg	4
“ “ “ “ “ other places	8
Number who received the degree between 1888-90	7
“ “ “ “ “ “ 1893-96	5
“ “ “ “ “ “ 1898-05	17
Number who are now professors or assistant professors in universities or technological schools	12
Number who are now instructors in the same	7

EDITORIAL

In the light of certain forecasts as to the respective futures of the Lawrence Scientific School and the Institute of Technology, the recent changes of organization of Harvard courses in Applied Science become of interest to readers of the REVIEW.

The following votes have been passed by the governing bodies of Harvard University:—

1. A degree of Bachelor of Science is established in Harvard College, the requirements for admission of students intending to become candidates for this degree to be the same as the present requirements for admission to the Lawrence Scientific School, and the requirements for graduation to be the same as the requirements for the degree of Bachelor of Arts in respect to the number of courses required, the grade of work demanded, and the length of residence. The new degree of Bachelor of Science, like the degree of Bachelor of Arts, will be given *without* designation of any field of study.

2. A Graduate School of Applied Science is established in Harvard University. The subjects in which degrees will be granted in this Graduate School will be for the present Engineering (Mechanical, Electrical, and Civil), Mining, Metallurgy, Architecture, Landscape Architecture, Forestry, Applied Chemistry, Applied Biology, and Applied Geology. A Bachelor's degree in arts or science, or its equivalent, will be required for admission to this School.

3. The present degree of Bachelor of Science *with* designation of the field of study, on completion of any one of the present four-year programmes of the Lawrence Scientific School (namely, Civil and Topographical Engineering, Mechanical Engineering, Electrical Engineering, Mining and Metallurgy, Architecture, Landscape Architecture, Forestry, Chemistry, Geology, Biology, Anatomy and Physiology, For Teachers of Science, and General Science), will be maintained as long as it shall seem best.

4. The new organization of the instruction in Applied Science will provide in Harvard College and the Graduate School of Applied Science, jointly, five years of instruction in the several fields of study in Applied Science.

5. The arrangements, above described, will take effect beginning with the academic year 1906-07.

The *University Gazette* adds an explanatory memorandum by which it appears that candidates for the new degree of Bachelor of Science will be free to select courses offered by the Faculty of Arts and Sciences subject to the existing regulations concerning the choice of studies in Harvard College, but that candidates for the S.B., as well as for the A.B., who expect to enter the Graduate School of Applied Science will ordinarily select their College courses with the advice of the department in which they are to become candidates for a degree. After such selection the period of residence in the Graduate School of Applied Science will ordinarily be two years, but may be more in the case of any Bachelor whose preliminary work has not been thus directed. Professional studies in Applied Science will thus be assimilated with professional studies in Divinity, Law, and Medicine in having a foundation of liberal studies. The present four-year programmes of the Lawrence Scientific School being for the present continued however, students will have the alternative of taking a four-year prescribed course leading to the degree of Bachelor of Science in a designated field of study, or, on the other hand, of choosing undergraduate studies freely with the object of obtaining the degree of Bachelor of Science without designation of the field of study in three to four years, and then pursuing a course of two or more years in the Graduate School of Applied Science leading to a professional degree.

Students now registered in the Scientific School will be allowed under certain conditions to choose between the new degree of Bachelor of Science without designation of the field of study and the degree of Bachelor of Science in a designated field, upon completion of one of the present four-year programmes.

So far as the bearings and effect of this somewhat complicated plan can be estimated by the layman, the University authorities

have sought to combine all the possible plans for education in Applied Science in a single institution. A student may not only elect studies, he may elect between election and prescription. The existing prescribed four-year courses in engineering are to be maintained for a time of which the uncertain duration is expressed by the phraseology "as long as it shall seem best." The logical alternative of putting the work in applied science on the same basis with divinity, law, and medicine, is evidently not quite attained, since students are encouraged to shape their undergraduate courses in such a manner that the professional course will occupy but two years.

The plan appears to have no necessary implication of any more advanced work in applied science than is now carried on at the University except as this may result from the joint provision for five years of instruction in the several fields of study in Applied Science as stated above.

If a comparison with Institute conditions may be hazarded, the students who follow the new plan will be in much the same situation as men who enter the Institute after obtaining the Bachelor's degree elsewhere, and are able to complete our professional courses in two, three, or four years, according to the character and extent of their preparation. Whether it will be practicable for the University to carry on side by side both academic and scientific undergraduate courses with prescribed schedules, and courses in engineering for men who have completed innumerable variations of the elective courses in Arts and Science, to say nothing of graduates of other institutions, seems likely to remain for some time to come an interesting question. It may be noted incidentally that the requirements for the new degree of Bachelor of Science without designation of the field of study appear to be identical with those for the degree of Bachelor of Arts except in respect to entrance requirements. It does not appear from the official statement what degrees will be given at the end of the graduate courses.

GENERAL INSTITUTE NEWS

CORPORATION NOTES

A special meeting of the Corporation was called for February 21, to fill the vacancy in the membership of the Executive Committee caused by the resignation of A. Lawrence Lowell, Esq. The special nominating committee brought in the name of Charles A. Stone, Esq., M. I. T. '88, who was unanimously elected. At a largely attended meeting held March 14 the Nominating Committee presented fourteen names of past students of the Institute nominated by the alumni under the by-laws of the Corporation adopted Dec. 13, 1905. The Corporation, by ballot, elected the following:—

For five years, Charles T Main, '76, Boston, Mass.; Frederick W. Wood, '77, Sparrow's Point, Md.; T. C. du Pont, '84, Wilmington, Del.

For four years, Frederick K Copeland, '76, Chicago, Ill.; Joseph P. Gray, '77, Boston, Mass.; Frank L. Locke, '86, Malden, Mass.

For three years, Eben S. Stevens, '68, Quinebaug, Conn.; Richard H. Soule, '72, Brookline, Mass.; Frederick H. Newell, '85, Washington, D.C.

FACULTY NOTES

Shortly after President Pritchett's resignation the Executive Committee requested the Faculty to appoint a chairman to whom certain duties might be assigned. At the faculty meeting of February 7, Professor A. A. Noyes was elected chairman.

The Faculty Committee on Advanced Degrees and Fellowships has been occupied during the present year with the preparation of an application for the acceptance of Institute graduates by German universities with the same consideration shown to graduates of the universities included in the Association of American Universities. A copy of the application is printed elsewhere in the

present number of the REVIEW (p. 197). A special form of certificate for holders of fellowships has also been prepared by the same committee and adopted by the Faculty.

Another special committee of the Faculty has reported on procedure with college graduates entering the Institute with advanced standing. On recommendation of this committee it has been voted that such graduates will hereafter be excused from certain requirements in general studies,—including English, history, and the general option,—on the basis of their degrees and irrespective of their specific attainments in these subjects. There is also a tendency toward somewhat greater latitude in the acceptance of equivalents for French and German in departments for which these languages are deemed less essential.

PUBLICATIONS

The Register of Graduates, issued in March, has now become almost as bulky as the Catalogue, the present issue containing no less than 352 pages. The familiar register of Bachelors of Science and their occupations occupies 175 pages, the classes since 1900 already covering nearly one-third of this. The special register of Masters of Science, introduced last year, includes 72 names, of whom 18 received their degree in 1905, and 12 in the previous year. These two classes included the first Naval Cadets. The geographical register follows, and is especially notable for the number and distribution of graduates now in foreign countries. Of 143 of these, 40 are in various parts of Canada, 34 in Mexico, 10 in England. Among more remote regions are: Costa Rica, 2; Ecuador, 1; Guatemala, 1; India, 1; Korea, 3; Persia, 1; Peru, Syria, and Turkey, 1, each; and the Transvaal, 3. 5 are in Panama. All the States and Territories and outlying possessions of the United States are, naturally, included. Among the larger cities of the United States, Boston, of course, comes first, with 691; Brooklyn and New York, second, with 349; followed by Chicago with 126 and Washington with 90. Philadelphia has 70, Pittsburg, 69, Schenectady, 38, Cleveland, 37, Cincinnati, 35, Providence, 32, Buffalo, 31, and San Francisco, 18. Among the picturesque postal

addresses are: Cockle Creek, New South Wales; Nanaimo, British Columbia; Ahmednagar, India; Chittaballie, Korea; Aguascalientes and Tlacolula, Mexico.

The alphabetical index is followed by the titles of theses of graduates in 1905, and by a chapter of statistics, including an interesting classification of occupations for graduates of each department. The list of local Alumni Associations, mentioned in the last Register, has been expanded by the addition of the Vermont Technology Association and the Technology Club of Minnesota.

GENERAL STUDIES

Third-year students have distributed themselves among the new options in general studies as indicated in the following table:

FIRST TERM		SECOND TERM
<i>Economics</i>		
Economic History	35	Railroad Economics 63
		Railroad and Finance 66
		Labor Problems 12
<i>English</i>		
Advanced English Composition,	9	English Literature of the Nine-
English Literature of the Eighteenth Century	34	teenth Century 20
<i>History</i>		
Comparative National Government	10	Municipal Government 63
International Law	67	
History of Science	53	
<i>Modern Languages</i>		
French III.	5	French III. and French Sight
German III.	22	Reading 10-12
French Sight Reading	14	German III. and German Sight
German Sight Reading	14	Reading 30-26
Spanish	76	Spanish 42

SUMMER COURSES

The summer courses offered in 1906 are as follows: in Mathematics,—Analytic Geometry and Integral Calculus; Applied Mechanics; Mechanical Drawing and Descriptive Geometry, Free-hand Drawing; in Mechanic Arts,—Woodwork, Forging, Chipping and Filing, Machine-tool Work; in Modern Languages,—French I., and II., German I., and II., Spanish; in Chemistry,—Inorganic and Analytical Chemistry, Quantitative Analysis, Organic Analysis and Preparations, Air, Water, and Food Analysis, Glass Blowing; in Physics,—Mechanics, Electricity, and Optics, Heat, Physical Laboratory, Precision of Measurements;—Surveying; Mechanism and Valve Gears and Mechanical Engineering Drawing;—Assaying; in Architecture,—Shades and Shadows, Design I. and II.; in Biology,—Industrial Bacteriology, Sanitary Research.

GENERAL NOTES

The will of Frank H. Cilley, '89, by which all the residual property of the testator, amounting immediately to about \$70,000, and, after the death of certain annuitants, to \$20,000 more, was left in trust for the benefit of the Walker Memorial Gymnasium, is being contested by the brother of the testator upon the ground that he was of unsound mind at the time when the instrument was executed. The case has been under trial before the Probate Court of Suffolk County; and a decision has recently been rendered by which the will is allowed. An appeal has, however, been taken; and the case is to be retried before a jury in the Superior Court, probably within a few weeks.

The Institute will be represented by President Pritchett at the approaching memorial of the two hundredth anniversary of the birth of Benjamin Franklin by the American Philosophical Society at Philadelphia.

In February Professor Tyler visited Alumni Associations in Chicago, Minneapolis (accounts of these meetings appear elsewhere in this number), and Buffalo, making incidental stops at

the Universities of Michigan, Wisconsin, and Minnesota. At Buffalo a luncheon was held at the Ellicott Club, with informal discussion of Institute affairs.

Professor H. A. Lorentz, the distinguished physicist of the University of Leyden, now lecturing at Columbia University, has recently made a brief visit to the Institute.

DEPARTMENT NOTES

MECHANICAL ENGINEERING

Following are the titles of theses for the candidates for graduation in Mechanical Engineering: Design and Test of a Meter for Measuring Feed Water of a Battery of Boilers 2,000 H. P.; Specific Heat at Constant Pressure for Superheated Steam; Test on Engines and Boilers of Blackstone Manufacturing Company, Blackstone, Mass.; A Duty Test on Brockton City Water Pump at Silver Lake; An Investigation of the Assistance given a Condensers Circulating Pump by Maintaining a Vacuum in the Discharge Pipe; Comparative Tests with Different Kinds of Coal on the Boilers of the Institute of Technology; Experiments on Hydraulic Mortars; An Investigation of the Effect of Varying the Percentage of Water for Standard Cement and Mortar Specimens; Efficiency Test of a 30 H. P. Westinghouse Gasolene Engine; Experimental Investigation of the Force to which Locomotive Driving Springs are subjected in Practice; Duty Test of the High Pressure Pumping Plant of the City of Taunton; Tests on an 800 H. P. and a 1,600 H. P. Cross Compound Rice and Sargent Engine for the Boston and Worcester Company, South Framingham, Mass.; Test of a Triple Expansion Pumping Engine at Taunton, Mass.; Determination of the Velocity of Steam in Vertical Pipes which will transmit Condensed Steam; Some Rack Tests of the Westinghouse Air Brake Apparatus; Tests on a 1,000 K.W. Westinghouse-Parsons Steam Turbine at Haverhill, Mass.; Test of a Diesel Engine at Baldwin Locomotive Works; Test to determine Economy and Thermal Efficiency of a Steam Generating Plant Using Crude Oil Fuel; Test of a Westinghouse-

Parsons Turbine; Tests on a Water-driven Electric Lighting and Power Plant at Farmington, N.H., with R. S. Clarke, Course XIII.; An Investigation of the Heating and Ventilating of the American Waltham Watch Factory; An Investigation of the Effect of Speed of Strain on the Strength of Rope; Test of a 500 K.W. Westinghouse-Parsons Turbine at the Savannah Electric Company; Efficiency Tests on the Chittenden Power Company's Water Turbines at Rutland, Vt.; Appel Rotary Engine; Test on 5,000 K.W. Steam Turbine of New York Edison Plant; Experimental Study of the Transverse and Compressive Strength of Full Size Locomotive Connecting Rods; The Design of an Electrically Driven Fine Goods Cotton Mill; Test on an Induced Draft System at Merrimac Manufacturing Company's Plant, Lowell, Mass.; Tests on Vacuum Cleaner; Test on Hudson Gas Engine; Tests to determine the Coefficient of Friction of Ball Bearings; Flow of Steam; Duty Test of the Wellesley Pumping Plant; Test on a Twenty-five Horse Power True Gas Engine and Producer Plant; Construction and Trial of a Yarn Testing Machine; Acceptance Test of 9,500 K.W. Curtis Turbine and Generator at Plant of Suburban Gas and Electric Company at Revere, Mass.; A Report on the Heating and Ventilation of the German Imperial Diet at Berlin; Uniformity of Speed and Efficiency of the Napier Four-cylinder Gas Engine; Test on 25 H. P. True Gas Producer and Engine at the Holmes Machine Company, East Boston; Some Tests on a Blackmer Rotary Pump; Investigation of Electrical High Temperature Furnaces; A Study of Tests upon Concrete Beams; Heating and Ventilation of Sleeping Cars; Measurement of Air with a Pitot Tube; A Study of Concrete Mixing Machines with Especial Attention to the Effect of Rapid and Violent Mixing; Variation in Density of Steel under Stress.

MINING ENGINEERING AND METALLURGY

Mr. J. T. Glidden, class of '05, has accepted a call to go to Portland, Ore., to assay the platinum metals for the United States Geological Survey in its black sand investigation, which is now in progress.

To take his place, Mr. A. W. Tucker, class of '99, has been engaged, and is now taking hold of the thesis work under Professor Richards. Mr. Tucker finds an opportunity to come back from the practical field of work to the school work, combining principle and theory, very attractive, and is enjoying his work with the students proportionately.

Seventeen men are taking theses on the concentration of ores; nine men are taking geological theses; nine men are taking theses in assaying, cyaniding, or lixiviation; seven men are taking theses in fire metallurgy or in metallography; and one is taking a thesis in the heat treatment of fire-bricks.

ARCHITECTURE

If the Corporation should be successful in obtaining land adjoining our present site and begin to plan buildings to relieve the present crowded condition of the Institute, the Department of Architecture sincerely hopes that its case will be among the first considered.

The space that we now occupy is greatly needed by the Engineering Departments. It is admirably suited for them, and would be available with little or no expense. Our direction, besides, is the only one in which they can expand.

The Architectural Department feels decidedly the necessity of expansion, and its methods of instruction call for special planning, which thus far we have only been able partially to obtain, though the Corporation has done for us the best it could with its limited means. The acquirement of land of sufficient area to demand a carefully studied scheme for its complete eventual development before beginning to build anything gives us the opportunity of presenting an ideal plan for the Architectural Department.

A very important feature of this plan would be the opportunity it should offer for instruction of the public. Our architectural schools are fitted with earnest pupils and instructors. The New York Beaux-Arts Society is steadily increasing its remarkable work, and so also the Architectural League of America. Architectural exhibitions are held throughout the land. There is plenty of enthu-

siasm within the pale, but outside there is lacking the generous support of all this effort by an appreciative public. The principal reason for this is undoubtedly the generally defective knowledge of what architecture is and what we are doing for it in the schools. It should be our effort to help cure this. We must offer sufficient attractions to the public to have it take a more personal interest in what we are doing, and make it welcome to frequent exhibitions of school work and loan collections, as well as to regular lecture courses on architecture and allied subjects. The higher the appreciation of good work by the public, the higher will rise the standard of the schools.

To accomplish all this, our important rooms must be easily accessible, and therefore on the ground floor or near it, and this brings us back to the question of plan. The department needs the opportunity to display effectively both large and small casts, a museum whose central part shall be, say, two stories high, with a one-storied aisle about it. This museum would serve also for an exhibition room of the current work of the pupils and of occasional loan collections borrowed from architects and other artists. To accomplish this in our present building or in one of its type would be a very difficult matter, but in the new scheme of building, which would undoubtedly be one involving central courts for light and air, would be our opportunity. A court could easily be covered with glass, one and two stories high, and a cast gallery, an exhibition room, life class and modelling rooms, could be placed under these skylights. In the building itself opening off the court would be placed the library, for which half as much room again as we now have is needed; and equally well placed should be a large lecture-room to which the public would be invited with our students, to listen to courses of lectures which we should have from the best authorities on all subjects associated with our profession. We should hear directly from the sculptor, the painter, the glass designer, the engineer, the biologist, and those skilled in questions of warming, ventilation, lighting, etc.

There should be, besides, a museum of building appliances directly connected with the regular lecture-room, so that its material could

be easily made to serve as illustrations in the regular course studies. It would be an easy matter to arrange the drawing-rooms, and, as far as possible, they also should be on the first floor for the readiest access to library and exhibition room.

We want nothing but the very simplest finish. We will do all the decoration of our walls with drawings and casts. So much of the education of the architect comes through his eyes, that we simply want the opportunity to have them rest on such objects of beauty as we are able to supply.

There is no better time in which to consider our prospective needs than when we are most successful.

The new arrangement of our class-room in which the students of the third, fourth, and graduate years work side by side has proved very satisfactory and most stimulating to both *ancien* and *nouveau*. It is the best feature of the French atelier, and is one that we should want to perpetuate in the new plan.

Just now the fourth-year students are finishing their drawings made in competition for the prizes offered by the Boston Society of Architects. The subject is "A Monumental Chimney in One of the Principal Halls of the Hague Palace." When this is finished, work on theses will begin.

In April is to be held in the department a competition to award a travelling scholarship of twelve hundred dollars, given by a friend in the interest of regular or special students who have taken graduate work within the last three years. This is the most generous gift for such a purpose ever given the department, and in the event of a satisfactory outcome of the competition there is a good chance of the prize becoming regularly established. It is hardly necessary to add that everything is being done to make this competition a success.

CHEMISTRY AND CHEMICAL ENGINEERING

Professor Talbot was the guest of the M. I. T. Club of Cincinnati on February 16, at their annual meeting, and later visited Professor Hughes at Miami University, Oxford, Ohio, Professor McPherson at the Ohio State University at Columbus, and met some

of the Institute men located in Cleveland, in particular those with the National Carbon Company and with the Sherwin-Williams Company. The trip through Ohio proved to be one of unusual pleasure and profit.

On March 13 the Senior students in the Chemical and Chemical Engineering Courses, the members of the Faculty of the Chemical Department, Mr. Samuel Cabot, Mr. A. D. Little, Dr. Whitney of Schenectady, Professor Norris of Simmons College, and Mrs. Richards were the guests of Professor Talbot at an informal dinner at the Tech Union. During the evening Messrs. Cabot, Whitney, Little, Walker, and Talbot discussed some of the various phases of the work of chemists and engineers after graduation from the Institute. These talks were of an informal character, and were replete with concrete illustrations drawn from the experiences of the speakers to emphasize the principles and precepts laid down. The company numbered forty-six.

Professor Walker gave a talk at Manchester, N.H., on March 12, before the Manchester Society of Arts, on Artificial Silk. This society, which includes many of the persons associated with the mills, owes much of its success to the efforts of Mr. W. K. Robbins. Dr. Walker has also spoken before the New England Section of the Society of Chemical Industry on the same topic as at Manchester.

Professor W. R. Whitney has recently given some talks at Cornell University on topics relating to the various forms of electric lamps.

Mrs. R. H. Richards recently spent a week at Cornell University, giving six lectures in their winter course in the Department of Agriculture, on "Sanitation." She has also visited New York and New Jersey, giving talks on Cost of Living, Food and Diet, and Euthenics, or better living through environment. She has also addressed a meeting of citizens at Springfield on the "Technical Education of Girls," the College Club of that city on "New Aspects of the Higher Education of Women," and the Woman's Culture Club at Northampton on the "Art of Right Living."

Professor Gill has recently addressed the Mechanical Engineering Society of the Institute on Lubricants and the Student Chemical Society on Explosions.

Dr. Miles S. Sherrill has taken charge of the short course in Theoretical Chemistry given to students of Courses III. and X., which has recently been given by Dr. J. W. Brown.

The new course of lectures on Inorganic Chemistry, which has been introduced into the third year of Course V., is given for the first time this term by Professor Fay.

A seminar for the discussion of recently published work in inorganic and analytical chemistry is held each Monday of the present term. It is attended by instructors and by some of the graduate students.

ELECTRICAL ENGINEERING

The annual excursion of the Senior students of this department took place in March, the party consisting of forty-four men, the instructing staff being represented by Professor Clifford, Professor Laws, Mr. Rodenbaeck, and Mr. Wentworth. The party left Boston on the afternoon of Tuesday, March 6, for Albany, free transportation and a special car being provided by President Tuttle of the Boston & Maine Railroad. On account of the size of the party two hotels were drawn on to furnish accommodations at Albany, where the nights of Tuesday and Wednesday were spent.

Wednesday morning early a start was made for the General Electric Company's works at Schenectady. On arrival the party was met by Mr. Emmons, the manager of the works, and turned over to four Tech men, who acted as guides throughout the day. The many interesting features of the works were thoroughly enjoyed by the men, the steam turbine department and the motors for the New York Central electric locomotives being of special interest. The courtesies of the Mohawk Club were extended to the party, some of whom took luncheon there on Wednesday.

On Thursday morning a visit was made to the works of the American Locomotive Company at Schenectady, where every facility was given for careful inspection of the construction of a locomotive from the initial forging to the finished product. New York Central electric locomotives in various stages of erection were seen and examined with great interest. The visit proved to be one of the most instructive parts of the entire trip.

After having luncheon together, the party left in a special car for New York, arriving about half-past five in the afternoon. Some of the Course VI. alumni living in New York had planned a dinner at the Café Boulevard for Thursday evening. After freshening up a bit, about thirty-five men took the subway for the meeting-place, and the party was increased by about a dozen of the New York alumni, and a most enjoyable hour was spent in dining and talking over student experiences.

On Friday morning the Waterside station of the New York Edison Company was thoroughly inspected, followed by a visit to one of the most recently installed sub-stations. In the afternoon the 59th Street power station of the Interborough Traction Company was visited, and C. W. Ricker, VI., '91, electrical superintendent, had gathered quite a group of Course VI. alumni to assist in showing the students the features of this most interesting and thoroughly modern station. From the coal-handling apparatus to the control board, everything was gone over carefully. From the sub-basement to the coal bunkers just under the roof, from the chilling breezes off the East River to the somewhat superfluous warmth of the boiler-rooms, the tortuous path of the coal conveyers was followed. It was all fascinating and mighty good exercise.

Saturday morning was spent at the General Electric Lamp Works at Harrison, N.J., and again Mr. Rogers, Mr. Marshall, and their assistants made this visit most thoroughly delightful and instructive. The process of incandescent lamp manufacture from the cotton to the finished article was shown, and the many ingenious devices and machines used in the work were carefully pointed out.

Saturday afternoon was spent at the West Street Factory of the Western Electric Company, and an appreciation was certainly had of the importance of the telephone industry. Many of the automatic machines used in manufacturing telephone apparatus were examined with the keenest interest. One of the most interesting devices seen was the machine for winding the toroidal coils which have now come to be so widely used in telephone circuits.

Some of the party returned to Boston on Saturday, a considerable majority, however, spending Sunday in New York and returning

by boat Sunday afternoon. The trip was the most successful that the students have yet enjoyed. Perfect weather, most courteous treatment, and a thoroughly fine *esprit de corps* combined to make it all that could be desired.

G. I. Rhodes, VI., '05, leaves on March 24 to accept a position as assistant to the electrical superintendent of the Interborough Rapid Transit Company of New York City. The opportunity was so exceptional that the department felt willing to allow Mr. Rhodes to leave before the end of the term. His place is being filled by Mr. A. S. Gibbs, who comes to us from the Fort Fairfield (Me.) Electric Light Company, where he has had charge of the plant.

Mr. Wentworth is spending all the time he can secure from his regular work in assisting in the development of an electrostatic separator which is giving results of great industrial importance.

As a result of the work on enclosed fuses which has been carried on this past year and is at present being continued, the manufacturers of such fuses are showing a spirit of co-operation in aiding the department in its development of work along lines which promise most valuable results.

There have been presented by the General Electric Company two mercury rectifier tubes, and by the Cooper Hewitt Electric Company one such tube, these being used by students in carrying on this investigation during the present term.

The Electric Storage Battery Company, the Gould Storage Battery Company, the National Battery Company, have all sent storage cells of the same rating, to be used in a careful and comprehensive study of such cells to be carried on this term as a part of the regular thesis work.

The Electro-Dynamic Company has loaned a 5 H. P. Interpole Motor for investigation, and a study is being made of its properties by one of the Seniors for his thesis.

A study of tantalum and osmium lamps is being carried on with the purpose of determining efficiency, life, and any special characteristics.

The demand for men of the present Senior Class has been very keen. Already representatives of the Bell Telephone Companies of

Boston and of Philadelphia, of the Westinghouse Company, the Allis-Chalmers Company, the Western Electric Company, have visited the department, and have spoken to the men in the class-room and as individuals. In addition there have been many inquiries by letter both for this year's class and for men of some experience in work outside the Institute. The present difficulty is to find men for places, not places for men.

On Tuesday, March 20, Dr. C. E. Lucke, Professor of Mechanical Engineering at Columbia University, came on from New York as the guest of the department, to speak at the meeting of the Electrical Engineering Society, which was held at the Union on that evening. Dr. Lucke gave a very clear and most interesting discussion of the gas engine proposition, speaking more particularly of the Koerting engine. This type is of special interest in view of its installation by the Boston Elevated Railway.

For the first time there is being given this present term some work on contracts and specifications. This work is for Senior students, and neostyled notes are being used in connection with it, giving the more important points for reference.

MATHEMATICS.

Professor Wells of the department has been granted leave of absence for the year 1906-7. Professor Osborne is engaged in the preparation of a new and considerably revised edition of his Calculus. Professor Woods and Professor Bailey are preparing a new text book as a substitute for the present course in Algebra and Geometry.

THE UNDERGRADUATES

THE CLASSES

Senior Class.—This was the largest at entrance that Tech had ever seen, and even after three and one-half years of the strenuous life it still has the largest membership of all the classes here. The number of regular students was, in the first term of the Freshman year, 433, while the special students numbered 48, a total of 481. At present there are 243 regular students in 1906, and of the few who are not designated as regular there will undoubtedly be some who will graduate.

These figures seem to show that about half the men have left the Institute since the first year. The number leaving is even greater than this, for the class has been strongly reinforced in the last two years both by men from other colleges and by former Tech men who have come back to complete their courses. Of the original 481 men associated with the class there remain only 160. The remaining 83 regular students in the class were not originally 1906 men. Why have so many men left the Institute during these three and a half years? The answer is not easy to make. One good reason, however, is that many of the 481 who entered in 1902 came incompletely prepared for their work. 1902 was the last year in which the old tuition rate of \$200 applied, and many men crammed up enough to pass the entrance examinations within that year who would have waited for at least another year, had there been no advance in tuition. The part that the standard of work has played in forcing men to leave is, of course, intimately connected with the amount of work, and, although this is no place in which to discuss the matter, this latter question is certainly one which ought to be thoroughly investigated. The class has lost but three men by death.

Barring the affair of a year ago last November, the class of 1906 has had the pleasantest of relations with the world in general. Our first field day was rather vigorous, it is true, but it did not cast us

down, and our second went much better—from our point of view. The baseball team did the class credit. 1906 athletes have done their share, and in the various clubs and societies 1906 men have been prominent. *Technique*, '06, will take its place with the rest of the *Techniques*, we believe. The class dinners have been well attended, and in all affairs of like nature the men have acted in perfect harmony. The Junior Prom which the class gave last year was held on a much more pretentious scale than any previous Prom, and has set the pace for others.

Just at present the work of the Class Day Committee is the chief event. It may interest Tech alumni to know that the proposition of wearing caps and gowns at Senior Week exercises was voted down by the men at the last class meeting. The Committee on Senior Night at the Union hopes to make that event a complete success. This will be held in April.

The programme for Senior Week is as follows:—

Thursday, May 31, class dinner and degree night; Friday, June 1, alumni reception; Saturday, June 2, Musical Clubs Concert; Sunday, June 3, Baccalaureate Sermon by the Rev. Alexander Mann at Trinity Church; Monday, June 4, Class Day spread on the lawn, Senior dance; Tuesday, June 5, Commencement exercises, President's reception, Pop Concert at Symphony Hall. The suggestion of a last informal dinner at the Tech Union has been approved of, and the night selected is April 14, the night of the Senior *Kommers*. The committee in charge of preparation is Henderson, Patch, and Raynolds.

While making experiments, the results of which were to be used as a basis for his thesis, Perley Kennison Dodge, '06, of Beverly, Mass., was killed at the power plant of the United Shoe Machinery Company at Beverly, March 12. He was a graduate of the Hardie Grammar and the Beverly High with the class of 1902, and stood high in his work at Technology.

Junior Class.—The sixth semi-annual class dinner was held at the Tech Union on the evening of March 8, 1906. Among the speakers were Professor C. Frank Allen and Professor Davis R. Dewey of the Faculty, Bursar Rand, and J. H. Leavill and E. H.

Packard of the class. Alexander Macomber acted as toastmaster. The committee in charge of the dinner consisted of Wonson, Miller, Tylee, Dodge, and Howe.

On March 31, the class had charge of the *Kommers* at the Union. Asst. District Attorney Guy Ham was the guest and speaker of the evening. John M. Frank acted as toastmaster, while the committee in charge consisted of Fales, Bancroft, Coffin, Bryant, and Packard.

Sophomore Class.—President Weinz is now at the Lowell Textile School. His resignation was accepted at a meeting held on February 16, and on February 21 A. W. Heath was elected to succeed him.

The following is a list of the *Technique* Electoral Committee: chairman, F. H. McGuigan; secretary-treasurer, H. Webb; W. A. Adams, H. E. Allen, M. E. Allen, J. S. Barnes, H. D. Bounetheau, C. H. Boylston, J. C. Brooks, W. F. Dolke, Jr., A. Ellis, H. T. Gerrish, B. L. Gimson, W. B. Given, G. T. Glover, A. W. Heath, W. R. Heilman, T. W. Orr, H. R. Putnam, H. A. Rapelye, J. T. Tobin, R. B. Todd, K. Vonnegut, E. I. Williams, and G. S. Witmer.

W. R. Heilman has been elected manager of the baseball team, and W. E. Barton captain.

Freshman Class.—The class has had one dinner at the Union which was quite successful. Arrangements are now being made for another to be held there this coming month.

Very few have resigned as a result of the mid-year examinations, and the places of those who have are now filled by the following: baseball manager, H. Sharp; football manager, W. S. Laird; football captain, K. D. Godfrey.

A committee of seven, consisting of R. H. Allen, A. L. Dickerman, Jr., G. E. Hodsdon, A. F. Jackson, W. W. King, H. F. Miller, and H. E. Whitaker, have been elected to prepare for the coming interscholastic prize drill.

PROFESSIONAL SOCIETIES

Architectural Society.—The society held a smoker at the Union February 16. In response to an invitation from the society, some thirty-five or forty men of the Architectural Department and of the "Pen and Brush Club" of Harvard attended. Quite a number of Technology graduates also were present.

Professor D. Despradelle, the speaker of the evening, described the masterly and artistic way in which Paris has been laid out, as a result of collaboration between architects, engineers, sculptors, and painters.

At a smoker held March 26, Mr. Robert S. Peabody, of the Corporation of the Institute, spoke on "Architectural Sketching."

Mining Engineering Society.—At a meeting of the society held March 9, Mr. E. G. Acheson gave a lecture on "Discovery and Invention."

At a meeting held March 20 Professor R. H. Lodge was the speaker. The subject was "Ores from a Commercial Standpoint."

Mechanical Engineering Society.—The society met at the Union March 7 to hear Professor Gill speak on "Lubricants."

Electrical Engineering Society.—The regular meeting was held at the Tech Union March 20. Dr. C. E. Lucke, a representative of the De La Vergne Machine Company, and also Professor of Mechanical Engineering at Columbia, delivered an address on "Gas Engines."

Civil Engineering Society.—At a meeting March 12 Mr. F. H. Fay, '93, who is at present the head of the Structural Department in the Boston City Engineer's office, gave a talk on "The Charlestown Bridge and Similar Structures."

Chemical Society.—At a meeting March 21, at the Tech Union, Professor F. H. Thorp spoke on "Some Inventions which have influenced the Chemical Industries."

CLUBS

Civic Club.—At a meeting at the Union March 12 it was decided to hold the regular meetings twice a month instead of once a month, as has heretofore been the custom, and altogether to make the club a vital factor at the Institute. A provisional programme, as follows, was adopted:—

First Meeting. *Resolved*, That the defects in American municipal government are due to our republican form of government.

Second Meeting. *Resolved*, That the students of the Massachusetts Institute of Technology are not fitted properly by their training at that institution for active and intelligent citizenship.

Third Meeting. *Resolved*, That municipal ownership is both possible and advisable in these United States.

Fourth Meeting. *Resolved*, That the best political development of cities is hampered by State interference.

Fifth Meeting. *Resolved*, That a Corrupt Practices Act similar to that now in force in Great Britain would improve the political situation in the country.

Sixth Meeting. *Resolved*, That Congress should grant subsidies to American ship-owners.

The Walker Club held a very successful dinner March 9, at the Technology Club. Besides the undergraduate members, Professors Merrill, Dewey, Doten, and Pearson and Messrs. Blachstein and Bushnell attended. After dinner President Loring, '06, of the club, introduced the speaker of the evening, Mr. Isaac W. Litchfield, '85, who spoke on the Technology Fund.

The Chicago Club held its eleventh annual dinner at the Marlborough Hotel Friday evening, February 16.

The Pennsylvania Club held a dinner at Tech Union Wednesday evening, February 14.

The Musical Clubs played at the Colonial Club, Cambridge, March 24, and outdid all former performances.

KOMMERS

Fifty men attended the first *Kommers*, February 17, and had a most enjoyable time. Governor Curtis Guild was expected to be present, but was prevented by his official duties. H. V. O. Coes, '06, of the House Committee, acted as toastmaster.

Rev. Charles F. Dole, president of the Twentieth Century Club, addressed, February 24, the second *Kommers*. Sixty-nine men, besides Rev. Mr. Dole and Mr. Rand, were present. J. H. Leavell, '07, acted as toastmaster.

Mr. Dole spoke on "The Place of Aristocracy in a Republic," defining an aristocracy as a government by the men best suited by training, education, and character to govern. He took as his American types of aristocrats George Washington, Benjamin Franklin, and Abraham Lincoln.

Ninety-two men were kept in roars of laughter March 3, at the third *Kommers*, by Professor Swain's reading of "The Awful German Language," by Mark Twain.

President Lucius Tuttle, of the Boston & Maine Railroad, proved a great attraction at the fourth *Kommers*, March 10.

President Pritchett spoke at the fifth *Kommers*, March 17. He said that the Corporation is considering the purchase of the large plot of empty ground between Berkeley and Clarendon Streets, opposite Lowell, as a site for the Walker Memorial Building. Dr. Pritchett does not believe that the gymnasium will be included in the main building, as a gym would destroy the main function of the building, that of being a student club-house. The gym will probably be built back of the Walker Memorial Building, so that it will not be a concrete part of the new building.

Mr. Ernest Thompson Stone entertained eighty-three men at the sixth *Kommers*, March 24, with a piano recital.

TECH SHOW: "THE FRESHMAN"

Following is a list of the principals of the show:—

Schofield, '09, Jenkins, '09, Ellis, '08, Boles, '07, Vonnegut, '08, Allen, '09, Adams, '08, Henderson, '06, Sando, '08, Seaver, '06, Coffin, '07, and Bancroft, '07.

Besides the usual matinée performances in Boston on Thursday and Friday of Junior Week, and the usual performance in Malden, the show this year will be given in Providence, R.I. The dates are April 26 and 27, matinées, Colonial Theatre, Boston; April 27, evening, Malden Opera House; April 28, evening, Schubert Opera House, Providence.

The libretto and lyrics were written by George Bryant, '07, whose experience in writing "The Chemical Maid," last year's successful play, has enabled him to produce an essentially modern up-to-date play, treating of college life and college men. All vaudeville features, including dances, have been omitted, and "The Freshman" approaches very nearly a professional show.

Y. M. C. A.

The Technology Y. M. C. A. held its regular weekly meeting February 27, for the first time, in the Trinity Church Parish House, the use of which has been generously offered by Dr. Mann, the rector, and the vestry committee of the church. Dr. Mann was the speaker. In a few words he warmly welcomed those present on behalf of the church, and hoped that Tech men would attend the Thursday noon meetings in the Parish House henceforth in large numbers. He was heartily glad that the Harvard merger had failed, and expressed his desire that a more intimate relation between the Institute and Trinity Church should develop in coming years.

At the meeting of the Technology Y. M. C. A. March 1, in the Trinity Church Parish House, Rev. Thomas Van Ness, pastor of the Second Unitarian Church, gave an intensely interesting and instructive talk on "Count Leo Tolstoi."

Professor Frank P. McKibben spoke on "The Social Obligations of the Engineer" at the Association meeting, March 22.

A delegation of members of the Technology Christian Association, consisting of the College Secretary, Mr. Don S. Gates, F. O. Adams, '07, L. Brock, '07, T. C. Keeling, '07, and A. Blake, '09, went to the Nashville Student Volunteer Conference February 26. This was the Fifth International Convention of the Student Volunteer Movement, and was attended by over three thousand students from all over the world.

ATHLETICS

N. E. I. A. A.

The Annual Convention of the N. E. I. A. A. was held February 27 at the Hotel Lenox. The election of officers resulted as follows: president, P. A. Bridgeman, Amherst; vice-president, L. G. Hinman, Williams; secretary, T. W. Worthien, Dartmouth; treasurer, L. Allen, Tech.

INDOOR DUAL MEET

Technology easily won the indoor dual meet from Tufts College at the gym by a score of 50 to 30.

CROSS COUNTRY

The Intercollegiate Cross Country Association met in New York on March 10 to arrange plans for next fall and elect new officers. Technology, Harvard, Yale, Cornell, Pennsylvania, Columbia, and Princeton were each represented by a delegate. Technology's representative, O. H. Starkweather, '07, was chosen treasurer.

FENCING ASSOCIATION

Harvard won the triangular fencing meet from Columbia and Tech February 16 at the gym. The score was Harvard 12, Columbia 8, Technology 7.

Harvard won the triangular fencing meet from Technology and the University of Pennsylvania at the gym March 2. The final score was Harvard 13, Tech 9, Pennsylvania 5.

TRACK TEAM

The track team held its annual dinner March 23 at the Tech Union. Fifty men were present, including the guests: Ellery Clark, President H. S. Pritchett, Major F. H. Briggs, '81, chairman of the Alumni Advisory Council on Athletics, Coach John Mahan, and M. T. Lightner, '06, captain of last year's team and formerly captain of the Harvard track team.

TENNIS ASSOCIATION

The two courts at the Technology Field are to be enlarged, to permit doubles to be played. A nominal fee of 50 cents for the season will be charged for the use of them. J. I. B. Larned, '07, will be temporary chairman of the Association until the next meeting, when an election will take place.

THE GRADUATES

COMMENCEMENT

As stated in the REVIEW for April, 1905 (page 196), it is the purpose of the past students of the Institute to hold every year a suitable alumni observance of the graduation season. The programme which was so successful last year is practically to be repeated this year. The date is Tuesday, June 5, and it is believed that most of the classes will hold spreads in the afternoon, dinners in the early evening, and will adjourn thence to the "Pop," where the entire hall will be reserved for M. I. T. men and their friends. The committee to have charge of the day is not yet appointed, but will be designated at a meeting of the Association of Class Secretaries, to be held April 20.

THE NORTH-WESTERN ALUMNI ASSOCIATION

The dinner of the North-western Alumni Association was held at the University Club, Chicago, Saturday evening, February 24. There were sixty-three members present, including thirteen from out of town. Dr. H. W. Tyler, Secretary of the Institute, who came on from Boston, was the chief speaker, and gave a very interesting talk on the Institute, emphasizing the development and progress of recent years and the confident expectation of continued advance. He was followed by Mr. B. R. T. Collins, former president of the North-western Alumni Association, and now with Stone & Webster, Boston. Mr. L. A. Ferguson, '88, second vice-president Chicago Edison Electric Company, and Mr. F. K. Copeland, '76, president Sullivan Machinery Company, followed with some concise, forceful statements as to the function of the Institute, its relation to the alumni and to the great industries of the country in general. An interesting letter was read from Colonel Livermore of the M. I. T. Corporation. The entire evening was given up to

a discussion of Technology affairs, alumni representation on the Corporation, Technology policy, etc. The evening was enlivened by music from one of the best-known Chicago orchestras and by hearty singing by the members. Before the dinner, reports of the outgoing officers were read and accepted, and new officers elected.

The officers during the past year were: Frederick Greeley, '76, president; E. H. Huxley, '95, vice-president; A. E. Zapf, '95, secretary and treasurer. The Executive Committee: J. L. Shortall, '87, E. M. Hagar, '95, and Kenneth Lockett, '02. The new officers elected are as follows: E. H. Huxley, '95, president; F. K. Copeland, '76, vice-president; and J. T. Cheney, '03, secretary and treasurer. The Executive Committee is H. P. Beers, '97, E. L. Andrews, '94, and J. L. Shortall, '87. The statement of the treasurer showed that \$384 had been collected during the year from dues and \$8 received from donations; that four dinners had been held, with an average attendance of forty-five members; that \$116.47 old debts had been paid off, all current bills paid, and \$40.86 in the treasury. Prior to the dinner an informal luncheon was given Dr. Tyler and Mr. Collins at the Chicago Club by the Executive Committee. The Association is under obligations to Dr. Tyler for his presence and his inspiring address, which cannot help but increase the enthusiasm and loyalty of the Western Tech men.

The following statistics in regard to the North-western Alumni Association may be of interest. The territory includes all the country west of Pittsburg and Buffalo. The resident membership, which includes territory within a radius of twenty miles of Chicago, is one hundred and eighty-three. The non-resident membership is four hundred and twenty-three. Dues were paid during the past year by one hundred and fifteen resident members and by one hundred and fifty-four non-resident members. Resident dues are \$2 a year; non-resident dues, \$1.

A. E. ZAPF, '95, *Secretary*,
American School of Correspondence, Chicago, Ill.

THE TECHNOLOGY CLUB OF NEW YORK

The eleventh annual dinner was held at the Arts Club, 37 West 34th Street, Saturday evening, Feb. 3, 1906, at 7.30 o'clock. The speakers were: Walter S. Logan, "The Party in Municipal Government"; William M. Ivins, "The Independent in Municipal Government"; Bird S. Coler, "Municipal Ownership"; Calvin Tompkins, "Municipal Improvements."

ALLSTON SARGENT, '98, *Secretary*,
36 East 28th Street, New York, N.Y.

THE TECHNOLOGY CLUB OF PHILADELPHIA

The Technology Club of Philadelphia is thriving to the entire satisfaction of those actively interested in its welfare.

On January 12 we had an informal supper at the Hotel Hanover, followed by the annual meeting and election of officers. The officers elected were as follows: president, Benjamin Adams, '95; vice-president, A. W. Ayer, '89; secretary and treasurer, Paul Weeks, '02. We at that time voted to adopt the membership card proposed for such clubs as ours by the Association of Class Secretaries.

On March 9 the annual dinner of the club was held at the Flanders Hotel. There were thirty-seven men present. Our guest of honor was Mr. James P. Munroe, '82. Toasts were responded to by Mr. Munroe, Mr. John Birkinbine, President of the Franklin Institute, Prof. Samuel P. Lindsay, of the University of Pennsylvania, and Mr. Glenn C. Mead.

The club now numbers forty-six members, and has a mailing list of one hundred and thirty. As a club, we are thoroughly pleased with the settlement of the "merger" agitation.

Following the thought brought out by Mr. Munroe at our dinner, we hope to be of use to the Income Fund Committee and to any body working for the interest of Tech, where work needs to be done in Philadelphia.

PAUL WEEKS, '02, *Secretary*,
1524 Swain Street, Philadelphia, Pa.

THE WASHINGTON SOCIETY OF THE M. I. T.

The Washington Society has been holding well-attended informal dinners and smokers on the second and fourth Mondays of each month at the University Club.

At the meeting of January 8 the society had as its guest Dr. George H. Eup. Thomas, of Wellington, New Zealand, who gave an extended informal talk on the topography and unique governmental and social conditions of his native country,—its hot springs and geysers and its highly developed paternal or socialistic form of government, which provides employment for all citizens able to work and pensions for the aged, has a tax system practically preventing the accumulation of large fortunes in the hands of single individuals, and has abolished poverty and practically abolished crime among the people. Dr. Thomas also added a talk on radium, and gave an exhibition of some samples of the new element.

At a meeting on February 12 a talk on Panama and the canal was given by Ralph Whitman, '01, assistant engineer with the Canal Commission, in this city. Mr. Whitman, having been a member of the party which visited the Isthmus recently with the Advisory Board of Engineers, has become well acquainted with the state of affairs down there, and the various plans for the building of the canal, in the development of which he has had an active part. His talk, illustrated by a collection of photographs, was much appreciated by those who heard it.

At a meeting of the Council of the University Club of Washington, February 24, Henry A. Pressey, '96, and Proctor L. Dougherty, '97, former presidents of this society, were elected respectively assistant treasurer of the club and chairman of the House Committee.

Cyrus C. Babb, '90, of the United States Reclamation Service, and a former director of this society, was married on March 7 to Miss Mary Grace Crowther, at the home of the bride's parents in Luthersville, Md. The bride was attended by her sister as maid of honor and by six bridesmaids. Following a large reception, Mr. and Mrs. Babb left for a stay of ten days at Atlantic City.

They will spend the summer in Montana, where he is engaged as engineer on the Milk River irrigation project.

Washington is well represented among the fourteen nominees elected by the alumni for representation on the Corporation.

F. W. SWANTON, '90, *Secretary*,
1641 13th Street, N.W., Washington, D.C.

THE TECHNOLOGY CLUB OF THE MERRIMACK VALLEY

The annual meeting was held at the Franklin House, Lawrence, on the evening of Feb. 2, 1906. The following officers were elected: president, R. A. Hale, '77, Lawrence; vice-president, George Bowers, '75, Lowell; member Executive Committee, William P. Atwood, '76, Lowell.

Action was taken on a communication from the chairman of the Committee on Closer Relations among Graduate Organizations relative to the adoption of a uniform membership card, and the following votes were passed:—

Vote 1. That members of any other local alumni organization of the M. I. T. be granted the privileges of this organization upon presentation of a membership card signed by the secretary of such organization.

Vote 2. That this organization adopt as its official membership card the card submitted by the Association of Class Secretaries of the Massachusetts Institute of Technology.

After the business meeting, dinner was served. At its close Mr. L. O. Towne, '78, of Haverhill, spoke at some length on the Hawaiian Islands, descriptive of a trip which he made in company with Professor Barton in 1904. He showed many curios and articles of dress. A very pleasing feature of the evening was the singing of native Hawaiian songs by a quartet of young men from Haverhill, who came with Mr. Towne.

The Technology men present were Hale, '77, Collins, '97, Nelson, '77, Chase, '74, Chase, '86, Eames, '97, Hildreth, '87, Bowers, '75, Silsbee, '74, Sjöström, '88, Hamblet, '88, Alden, '77, Atwood, '76,

Edwards, '78, Towne, '78, Walsh, '81, Chalifoux, '02, Ashton, '93, Smith, '97, Morrill, '09, Morrill, '07, Stevens, '07, Brown, '08, Dalrymple, '08, Rhodes, '05, Morton, '04, Avery, '03, Barker, '96, Gage, '96, Gilbert, '95, Mather, '07, Scannell, '08, Hobson, '06, Wright, '06, Harvey, '06.

JOHN A. COLLINS, JR., '97, *Secretary*,
74 Saunders Street, Lawrence, Mass.

THE CINCINNATI M. I. T. CLUB

The annual meeting was held Friday evening, February 16, at the Business Men's Club.

The society was very much honored to have as a guest Professor Talbot of the Institute, who had come from Boston especially for this occasion. He gave a most interesting talk on the present status and future prospects of Technology.

The following officers were elected: president, George W. Kitredge; vice-president, Jno. A. Hildabolt; secretary, R. W. Proctor; treasurer Stanley A. Hooker; member of the Executive Committee, Jos. R. Hellms.

A. H. PUGH, JR., '97, *Secretary*,
1912 Madison Road, Cincinnati, Ohio.

THE TECHNOLOGY CLUB OF NEW BEDFORD

NEW BEDFORD, MASS., March 10, 1906.

TECHNOLOGY REVIEW, 83 Newbury Street, Boston, Mass.

Gentlemen,—Since the annual dinner in November, there has been but one regular meeting of the Technology Club of New Bedford, at which three new members were elected. Membership is now twenty-one. We should be pleased to hear from any Tech men who are located in New Bedford or vicinity.

Yours very truly,

CHARLES F. WING, JR., '99, *Secretary*,
34 Purchase Street, New Bedford, Mass.

THE TECHNOLOGY CLUB OF HARTFORD, CONN.

On January 6 the club held a dinner in the Rathskeller at the Hotel Heublein, at which Mayor Henney was the guest of honor and the principal speaker. The speaking was informal in its nature, and a general discussion followed Mayor Henney's address on "How can Technology Men be of Public Service in a Community like Hartford?" Those present at this dinner were George W. Baker, Henry Souther, C. F. Barrett, Edward Lorenz, W. H. Beers, C. E. Whitney, Herbert Babson, E. W. Pelton, Charles Pettee, C. T. Lincoln, Howard Burdick, Horace H. Ensworth, A. L. Patrick, G. H. Shaw, H. T. Rollins, C. R. Mason, P. M. Arnold, J. E. Lewis, and H. P. Maxim.

The club held its annual meeting February 3, at the Hartford Club, and elected the following officers: president, Howard H. Burdick, '97; vice-president, Henry Souther, '87; secretary and treasurer, George W. Baker, '92.

A. Maynard Holcombe, of the class of '94, was the toastmaster at the dinner following the election, and was introduced by President Burdick. The speakers were Charles P. Howard, Henry Souther, and H. P. Maxim. Mr. Howard talked about his trip with Professor C. S. Hastings, of New Haven, to Spain last year to see the eclipse of the sun. He showed pictures and drawings of the corona as he had seen it through the telescope, and showed for comparison drawings of the corona of 1900.

Mr. Souther spoke on conditions at the Institute to-day, and referred to the proposition to unite it with Harvard. Mr. Maxim told of some of the experiences and troubles in the early days of automobiling in Connecticut and of an early auto race at Branford.

Those present were Charles P. Howard, Henry Souther, George W. Baker, William H. Beers, D. A. Richardson, Charles T. Lincoln, Howard H. Burdick, A. L. Patrick, Charles L. W. Pettee, A. Maynard Holcombe, Edward Lorenz, Clarence E. Whitney, S. Elsworth Horton, Horace H. Ensworth, Charles R. Nason, A. L. Whitmarsh, of New Britain, H. P. Maxim, George H. Shaw, Charles F. Barrett,

Perrie M. Arnold, Walter H. Bunce, F. M. Southard, H. A. Fiske, F. C. Moore, J. A. Newlands, of Middletown.

GEORGE W. BAKER, '92, *Secretary*,
P.O. Box 983, Hartford, Conn.

THE VERMONT TECHNOLOGY ASSOCIATION

Since the last report we have lost J. F. Ancona, '03, president of the Association, who has moved to Rochester, N.Y. The annual meeting as prescribed by the constitution will be held in April or May, and it is our plan to hold it in Burlington, as a number of the men are located there. The Association holds its membership, though it has not acquired any new members recently.

R. PROCTOR, JR., '02, *Secretary*,
Proctor, Vt.

THE MINNESOTA ALUMNI ASSOCIATION

The Minnesota Alumni Association held their second annual dinner at the Minnesota Club on February 27, with the following members present: W. H. Bovey, '94, A. W. Friend, '02, C. M. Hardenbergh, '03, E. H. Hewitt, '99, T. A. Foque, '88, H. M. Hickok, '03, H. W. Jones, '82, N. E. Seavey, '99, J. W. Shuman, '97, M. L. Sperry, '00, J. Stone, Jr., '99, H. Yoerg, '95.

Professor Tyler spoke informally in regard to the present situation at the Institute and the importance of closer relations between the Corporation and Faculty and the outside alumni.

THE TECHNOLOGY CLUB OF CLEVELAND

The Cleveland Technology Club was formed in March, with R. B. Wallace, '99, as president and Azel Ames, Jr., '95, as secretary.

THE TECHNOLOGY CLUB

One very pleasant feature of the life of the Technology Club this winter has been the increasing use of the club-house by undergraduates. It is to be regretted, however, that the purpose and the advantages of the club are not more fully realized among the undergraduates. In January the club had the pleasure of hearing Dr. Morton Prince give his very interesting talk on "Multiple Personality." In March two talks were given, one by Mr. Percival Lowell on "Mars," and one by Mr. Joseph Linden Smith on the "Opening of a Tomb in the Valley of the Kings."

LEONARD T. BUSHNELL, '05,
83 Newbury Street, Boston.

NEWS FROM THE CLASSES.

1868

PROF. ROBERT H. RICHARDS, *Sec.*, Mass. Inst. of Technology,
Boston.

Walter H. Sears has recently been appointed chief engineer of the Aqueduct Commission of New York City, at a salary of \$10,000 a year. He seems very happy in his new position.—Eben S. Stevens has been elected a member of the Corporation of the Massachusetts Institute of Technology, to serve three years. He is one of the members of the Alumni Association who goes in under the new by-laws providing for alumni representation on the Corporation.—Whitney Conant and his wife were visited the other day by Robert H. Richards. They are at Hotel Regent, New York City, where they are living very happily. The two old classmates had a fine time together, talking over old times.—Robert H. Richards has recently made a trip to Lebanon, Pa., where he had been called in consultation in regard to the new magnetic concentrating plant. He also visited Capelton, Can., to consult in regard to concentration of pyrites, and he visited Halifax, where he spoke before the Mining Society of Nova Scotia in behalf of technical education and testing works for the Province.

1872.

PROF. C. FRANK ALLEN, *Sec.*, Mass. Inst. of Technology, Boston.

R. H. Soule has been elected as one of the alumni members of the Corporation, to serve for three years. Soule has many excellent qualities for the office. Before entering the Institute, he had done some work in civil engineering, but took his degree as a mechanical engineer, and was for three years in general mechanical engineering in responsible positions, after which he went into railroad work,

being trained for this on the Pennsylvania Railroad, on which he had experience in special lines, such as signal work and the testing department. In railroad work he served as superintendent of motive power upon several divisions of the Pennsylvania and on one of the divisions of the West Shore Railroad, was superintendent of motive power for the entire system of the Norfolk and Western Railroad, and was at one time general manager of the Erie Railroad. For a time he represented the Westinghouse people, partly on signal work and partly in developing and introducing the friction buffer, which has lately been accepted as a necessary feature of the heavy cars now used. He was also for a while connected with the Baldwin Locomotive Works, part of the time representing them abroad, and for a time in Chicago. He finally opened a private office as a general railroad mechanical expert, the arrangement of railroad shops being a specialty for which he was in demand. Soule also had high standing in the railroad professional organizations, having been selected as one of the editors of the *Car Builders' Dictionary*, and having been also president of the *Master Mechanics' Association*. His experience has covered a very wide range of work. His residence has been in various parts of the United States. He has had a business experience abroad and a college training both at Harvard and at the Institute. All these unite in giving him an equipment for breadth of view which ought to make him one of the most valuable members of the Corporation. From the "Brookline standpoint" Soule is all right, as he has a son now in the second year's class in architecture at the Institute. Soule was looking fine the last time the class secretary saw him, a week or two ago.—F. A. Emmerton is abroad for a time. He still makes Cleveland his home.—M. B. Patch is still at Buffalo, where the secretary saw him a year ago. He is the same old Patch, grayer than he was thirty years ago, but a good deal the same. His second daughter is to be married within the next month.—C. F. Allen has recently been elected president of the New England Railroad Club. He has also just returned from the Convention of the American Railway Engineering and Maintenance of Way Association in Chicago. These are points of contact with railroad work which he finds it necessary

to keep up, so as not to get into a rut. On the return from Chicago he stopped over at Cleveland to talk to the Institute men there who could be assembled at short notice, and he is pleased to state that a Tech Club was organized then and there, with R. B. Wallace, '99, president, and Azel Ames, Jr., '95, secretary.—In Cleveland the class secretary also found E. A. Handy, '75, occupying the chair of general manager of the Lake Shore Railroad, and A. W. Johnston, '73, general manager of the Nickel Plate Railway, both recent appointments. Johnston is also vice-president of the Maintenance of Way Association, and was one of the secretaries of the International Railway Congress which met last May in Washington.

1874.

CHARLES F. READ, *Sec.*, Old State House, Boston.

George H. Barrus, president of the Class Association and vice-president and member of the Council of the American Society of Mechanical Engineers, has been invited by President Roosevelt to serve on the newly appointed national advisory board on fuels and structural materials. Mr. Barrus joined the American Society of Mechanical Engineers in 1883, and since that time has contributed many papers and discussions to its Transactions. He was chairman of the committee of the society which prepared a "Standard Method of Conducting Duty Trials of Pumping Engines." He also served on a similar committee of the society for devising standard trials of locomotives and one for standard tests of engines in general. He was also a member of the Revision Committee on the "Code of Rules for Conducting Boiler Trials," the other members being Messrs. Emery, Porter, Thurston, Kent, Dean, Hunt, Coon, and Potter. He is a member of the Boston Society of Civil Engineers, the New England Water Works Association, the Society of Naval Architects and Marine Engineers, and belongs to the Engineers' Club, the Technology Club, the Bostonian Society, the Boston Club, and the Allston Golf Club. He is the author of books entitled "Boiler Tests" and "Engine Tests," as

already stated; also of one on the "Tabor Steam Engine Indicator" and one on "The Star Improved Indicator," and has contributed many papers and articles to societies of which he is a member and to mechanical engineering journals.—A lunch of the Class Association was held February 19 at the Boston Club by invitation of the president. The following members were present: Messrs. Baldwin, Barrus, Blunt, Chase, Magee, Read, and Russ. The principal business transacted was the relation of the Class Association to the Technology Fund Association.

1875.

E. A. W. HAMMATT, *Sec.*, 10 Neponset Block, Hyde Park, Mass.

The annual meeting and dinner was held at Young's Hotel on Friday, March 9, at 7 P.M., with the following attendance: President Thomas Hibbard, Vice-President B. L. Beal, and Messrs. Bowers, Dorr, Eddy, Hammatt, Handy, J. M. Howe, Mixter, and Willard. Prentiss and Warren had sent word that they intended to be present, but failed to appear.—C. H. Williams resigned from the executive committee, and Willard was elected to fill the vacancy, and the rest of the old board were re-elected. Several letters were received from men unable to attend.—Handy has recently been made general manager of the L. S. & M. S. Ry. Co.—Edes is now connected with the "Maintenance of Way" Department, and says that while he likes being in civilization, he does not enjoy the work so much as he did that of location. He says the outlook for railroad work in California is very bright for the coming year.—Bush, from whom the secretary has not heard for nearly fifteen years, is now in Pittsburg, Kan.—The secretary recently received a letter from Goodale describing a trip he made to Alaska in July last, with the American Institute of Mining Engineers. He says:—

"The trip from Vancouver to Skagway is through channels between islands and the main-land, a distance of about nine hundred miles, and was like a trip on a large river, as there were only two places where for an hour or two the swell from the Pacific was felt." From Skagway to White Horse the party

took the White Pass. At one point the remains of a large lake were passed. It seems that, when building the railroad, to get a suitable grade the engineers dug a ditch in order to lower the level of this lake about ten feet; but, as the shores were clear sand, the out-rushing waters cut down nearly 70 feet, and practically drained the lake. White Horse is at the head of navigation of the Yukon and its tributaries, and is at an elevation of 2,084 feet. Dawson, 450 miles down the Yukon at its junction with the Klondyke, is 1,200 feet above sea-level. This fall of nearly two feet per mile gives quite a current; and the trip down by steamer, including a number of stops, took thirty-eight hours, while the return trip took about eighty hours. At midnight it was light enough to read on the steamer deck, making it hard to realize the time of day.

Navigation between White Horse and Dawson opens about June 5 and closes early in October; and during eight months of the year the only transportation for passengers is by the Royal Mail Stages, which make the 365 miles in from four to five days. With the low temperature of midwinter, sometimes 70° below zero, it can be imagined that travelling for pleasure is not very extensive during that season. One of the things furnished for the entertainment of the party at Dawson was a baseball game, to be called at midnight; but on account of rain it was omitted:

Since Aug. 15, 1896, when gold was first discovered in the neighborhood of Dawson, to the close of 1905, about \$124,000,000 has been taken from the Yukon territory. The yearly production has declined since 1900, but the introduction of dredging machinery and hydraulic appliances may change this. Dredging, however, is somewhat expensive, because a few feet below the surface of the ground, even in midsummer, is eternal frost, which must be thawed by steam jets, and wood costs \$15 a cord.

1877.

RICHARD A. HALE, *Sec.*, Lawrence, Mass.

The annual dinner and reunion was held at the Technology Club Wednesday, February 28, with nineteen members present. The following officers were elected: Henry H. Carter, president; C. F. Lawton, vice-president; R. A. Hale, secretary and treasurer. Music was furnished by Mr. Jenney, and former Tech songs were rendered, in which all joined. It was concluded to have some special features

at the meeting in 1907, which will be the celebration of the thirtieth anniversary.

1878.

LINWOOD O. TOWNE, *Sec.*, Haverhill, Mass.

For the annual reunion the members of the class were guests of President Baker at the Union Club, Boston, January 6. Except at the twenty-fifth anniversary, the number present was greater than any since graduation, and the wholly informal event was much enjoyed. Besides the host there were present Bradford, Collier, Edwards, Henshaw, Higgins, Miller, Nichols, Rich, Robertson, Rollins, Sargent, Sawin, Schwamb, Williams, Woolworth, and Towne.—For ten days in latter February the secretary was on pleasure bent in New York City. He was especially favored by chances to visit the tunnel work now being done under the East River by the Rapid Transit Construction Company from the Battery to Joralemon Street, Brooklyn, which is running two thirteen-feet “tubes,” and also by the Pennsylvania Railroad Company at 34th Street and Long Island City, where four twenty-three feet tubes are being placed to accommodate electrically not only their own trains, but those of the New York, New Haven & Hartford. Not since his years in Colorado has the secretary seen so much of underground, and never then such large tunnels. The caissons, with all their interesting and dangerous elements, the shields, the rings for forming the tubes, the ingenious methods of connecting their plates, and many other points proved of great interest. Having to sign the “death book” before descent gave a certain air of distinction and adventure to the occasion, as well as relieving the company of possible funeral expenses. The story of the workman who was recently forced by the compressed air up through twelve feet of mud, fifteen feet of water, and finally shot twenty-five feet into the air,—and lived to swim and tell the tale,—had all the gruesome points needed by a quiet Massachusetts man in giving atmosphere to the Metropolis. It seems that at the time the *New York Journal* had the exclusive story, regarded by the other papers, yellow and

otherwise, as quite duly and appropriately visionary. Imagine the swelling joy of injured innocence! In these undertakings the secretary was cared for most royally (even to the courtesies of the "Hog House" provision for the outer man before descent and the inner one on ascent) by Messrs. Geo. A. Fairfield, M. I. T. '04, and Roswell Davis, '05. As he was further the guest of Stanley A. Foster, '03, of the New York Consolidated Gas Company, during his stay in the city, it was quite a renewal of youth to one who is having to think of his class as one in the "early days." With other entertaining joys provided by friends during his visit, the secretary feels that he has been quite gay.—Mr. George W. Kittredge, of Cincinnati, Ohio, formerly of North Andover, Mass., was on April 1 appointed chief engineer of the New York Central & Hudson River Railroad, with headquarters in New York. Mr. Kittredge, after a short service on the development of the South Boston Flats where the New York, New Haven & Hartford Railroad is now located, went in 1880 to the Pittsburg, Cincinnati & St. Louis Railway Company, one of the Pennsylvania Lines. He was with the Pennsylvania Lines for ten years, being employed in the Maintenance of Way Department. In 1890 he went to the Cleveland, Cincinnati, Chicago & St. Louis Railway Company, and on July 1, 1891, was made chief engineer of that company,—a position which he has since held. He is also chief engineer of the Peoria & Eastern Railway, and of the Louisville & Jeffersonville Bridge Company. He is a member and past president of the Engineers' Club of Cincinnati, and was a charter member of the American Railway Engineering and Maintenance of Way Association, having been its second president, and since then one of its Board of Directors. He is also a member of the American Society of Civil Engineers. The position of chief engineer of the New York Central & Hudson River Railroad is looked upon as one of the highest positions in railroad engineering that this country has.

1882.

WALTER B. SNOW, *Sec.*, 29 Russell Avenue, Watertown, Mass.

The twenty-fourth anniversary dinner was held at the Technology Club, Tuesday evening, January 30. Gooding, Hall, Munroe, W. B. Snow, Warren, and A. W. Walker were present. Plans were discussed with regard to the twenty-fifth anniversary.—At a recent meeting of the Alumni Association of the Philadelphia Textile School, the principal speaker was John P. Wood, of William Wood & Co. He expressed the belief that the Textile School should apply itself to working out the problem of some standard method of cost finding which might answer for all products which the textile industry produces.—Thomas B. Carson, who is secretary and treasurer of the Bettendorf Metal Wheel Company, is also second vice-president of the Iowa Manufacturers' Insurance Company.—Harry G. Manning is now busily engaged in remodelling all the plants of the Crucible Steel Company of America. His present address is Pittsburg, Pa.—John H. Ross was abroad at the time of the class dinner.—James P. Munroe recently spoke before the Civic League of Lynn on "Civic Watchfulness," before the Harvard Teachers' Association on "The Joint Responsibility of the School and the Community," and before the Twentieth Century Club of Boston on "Technical Schools."—At the hearings given before the Congressional Ways and Means Committee regarding the removal of the tax on alcohol which has been denaturized, Rufus F. Herrick appeared for the New England Section of the Society of Chemical Industry and the American Chemical Society. He stated that it was entirely practical to denaturize grain alcohol so that its purification would be much more difficult and costly than is the illicit distillation of whiskey from corn, sugar, or molasses. He is busily engaged in an educational campaign among the New England manufacturers who would greatly profit by the removal of the present tax.—Walter B. Snow was recently re-elected for the fourth consecutive three-year term as trustee of the Free Public Library of Watertown, Mass. He is chairman of the board.

1884.

PROF. WILLIAM L. PUFFER, *Sec.*, Mass. Inst. of Technology, Boston.

The annual dinner of the class was held at the Technology Club, Wednesday, February 21, at 6.30 P.M. There were present Appleton, Bardwell, Doane, Gill, Hammett, Mellen, Puffer, Tyler, and Rotch. After a very enjoyable dinner and exchange of ideas, messages and letters were read, more of which were received than at any class dinner within the recollection of the present secretary.—The secretary is pleased to announce that T. H. Bartlett has received the appointment of register of the Lewiston Land Office, Idaho, for the next four years.—Dearborn is generally a regular attendant, but was detained at home by sickness.—Ryder sent his usual regrets that the dinner had not happened at some time when he had not something else to do.—Lyle sent a long letter from his station at the Augusta Arsenal, and says:—

I am on my "last enlistment" for three years, as we say in soldiers' parlance, entering on it at 12 M. Jan. 21, 1906. I completed my forty years' service in the army on Oct. 17, 1905, and thirty years' work in the Ordnance Department the same day, by a coincidence. Will complete thirty years' service with the Treasury Department on June 6, 1907, or a little over a year hence. I begin to feel like letting up on the hustle.

—A very jovial letter from Bridgman announces that, while he has no gray hair or absence of hair like some of the past secretaries, he detects the passage of the twenty-five years by the presence of bifocal lenses, a vulnerable heel, and an undue difficulty in administering sixteen slaps on the celebration of his eldest son's birthday.

1885.

I. W. LITCHFIELD, *Sec.*, 161 Devonshire St., Boston.

The election of Frederick H. Newell as a three-year-term member of the Corporation of the Institute brings a new honor to Mr. Newell,

as well as to '85. Newell has won his spurs on the United States Geological Survey, and, as chief engineer of the Reclamation Bureau, holds one of the most important engineering positions in the government service. The class of '85 is represented in Institute affairs by a member of the Corporation, the president of the Alumni Association, the chairman of the Income Fund Committee, two members of the Faculty, and one of the lecturers for the present year.—There are few events at Camp Walker that escaped the omnipresent lens of the camera; and, when Fred Kimball threw some new camp pictures on the screen at the dinner, February 3, we were again up in the woods, doing it all over again. No business was transacted at the meeting; and, save a few remarks on the Income Fund by Morss, it was purely social, and was one of the most enjoyable meetings the class has ever held. Those present were C. R. Allen, Bartlett, Benton, Dodge, Fry, Homer, F. M. Kimball, J. L. Kimball, Litchfield, Little, Morss, Osgood, F. H. Page, Pierce, Plaisted, Pratt, Steele, Talbot, Worthington. Dr. Schubmehl was present as an adopted member of '85.—Nat Robertson and E. H. Mumford happened in town on the same day recently, and put up at the same hotel. A small '85 delegation met them, and tried to make them comfortable.—Since Pickernell was made assistant to the president of the American Telephone and Telegraph Company, he is away from Boston most of the time. A petition is in circulation among his friends in the class, asking that he be given a switchboard in one of the Boston exchanges, so that we may see something of him.—The office of the Samson Cordage Works, of which H. G. Pratt is treasurer, has been moved from 115 Congress Street, Boston, to 88 Broad Street.

1886.

PROF. A. G. ROBBINS, *Sec.*, Mass. Inst. of Technology, Boston.

It is with a feeling of deep sorrow that the secretary reports the death of our classmate, J. Frank Seavey, who died in Melrose, Mass., January 15 last. In 1882 Seavey entered the Institute from the Charlestown High School, and took the Mechanical En-

gineering Course. Since graduation he has been engaged in civil and mechanical engineering, for the last three years with the American Steel and Wire Company of Worcester. A wife and two children survive him.—Announcement is made elsewhere of the election of Locke to term membership in the Corporation of the Institute of Technology. He has recently started for California, there to seek rest and renewed strength in an extended vacation.—Noyes was recently elected chairman of the Faculty of the Massachusetts Institute of Technology.—The secretary has received an advertisement of the Buffalo Testing Laboratory, of which Ricker is president and general manager. Shedd, '81, is associated with him as chemist and metallurgist in the same enterprise.—Winsor was elected president of the New England Street Railway Club at its last meeting.

1887.

EDWARD G. THOMAS, *Sec.*, 161 Devonshire Street, Boston.

The twenty-third annual dinner of the class of '87 was held at Young's on Feb. 21, 1906. After the reports of the secretary and treasurer were read and filed, the usual election resulted in the choice of the following officers for the ensuing year: president, Frank F. Carpenter; vice-presidents, Gelett Burgess and H. S. Adams. J. A. Cameron was appointed chairman of a committee to arrange for our twentieth celebration in June, 1907, with authority to add any members of the class he may desire. The secretary reported on the progress of the Income Fund, and the president was directed to appoint an official Income Fund Committee of the class of '87. After business was disposed of as above, the class listened with great pleasure to the interesting remarks of the guests of the evening, Professor Elihu Thomson, of the General Electric Company, and Professor Harry E. Clifford, of the Institute. While both gentlemen spoke upon the growth of knowledge of electricity and its commercial applications, Professor Clifford very greatly interested all present by putting before us his views as to needed improvement and change in the present methods of teaching science.

The following members of the class attended the dinner: H. D. Sears, Draper, Coburn, Cameron, W. A. Whitney, H. S. Adams, Burgess, Carpenter, W. H. Brainerd, Taintor, Wakefield, H. F. Bryant, Young, Very, Souther, Tripp, Gerrish, Fred Thompson, and E. G. Thomas.

1888.

WILLIAM G. SNOW, *Sec.*, 1108 Penn Mutual Building, Boston.

Stephen Child, landscape architect and consulting engineer, has removed to the Ford Building, 15 Ashburton Place, Boston.—George C. Scales visited Boston in February, while on a trip from Porto Rico. Next year he intends to return to the United States permanently.—G. U. G. Holman has left Quebec, and is now located in the Land Title Building, Philadelphia, Pa.—Loveland has recently been abroad on a short business and pleasure trip.—H. F. Pierce is treasurer of the Boston and Oaxa Mining Company of Mexico, with headquarters at 7 Water Street, Boston.—B. R. T. Collins, representing the Alumni Association, and Dr. H. W. Tyler, the Faculty, visited Chicago in February, and on the 24th were guests at the banquet of the North-western Association of the M. I. T., held at the University Club. Collins spoke in favor of the Technology Fund needed for new equipment and for general use, and contrasted the Institute of to-day with what it was at the time '88 was there, pointing out the great gains made in the number of students, in its plant and its prestige, and the changes in the *personnel* of the Faculty and of the Corporation, and the infusion of younger blood in these bodies. He called attention to the fact that the future policy of the Institute must be determined largely by its financial condition, and urged the North-western alumni to do their share towards providing for the immediate needs of the Institute by subscribing liberally to the Income Fund.—Stone & Webster have issued their "Electric Railway and Lighting Properties" manual for 1906, giving brief descriptions of the various properties under their management. The combined capitalization of the twenty-eight companies is: bonds

issued, \$41,331,000; stock issued, \$52,881,200; total, \$94,212,000. Miles of equivalent single track operated, 817; passengers carried, 132,300,000; incandescent lamps (16 candle-power) in service, 920,000. The total earnings and expenses in 1905 were: gross earnings, \$10,921,520; operating expenses, \$6,829,718; net earnings, \$4,160,405; interest charges, \$1,777,404; net profits, \$2,448,805; dividends, \$866,700; surplus, \$1,582,105.

1889.

PROF. F. A. LAWS, *Sec.*, Mass. Inst. of Technology, Boston.

The *Electrical World* of Feb. 24, 1906, contains the following account of W. H. Merrill, Jr.:—

William Henry Merrill, Jr., was born Jan. 10, 1868, at Warsaw, N.Y., and was educated in Holderness School, Plymouth, N.H., and at the Massachusetts Institute of Technology, Boston, where he was a member of the class of '89. Upon leaving the Institute, he became connected with underwriters' electrical inspection work in Boston, and in 1893 went to Chicago, where the following year he started in a very small way what has, under his supervision, now grown to be the Underwriters' Laboratories of the National Board of Fire Underwriters, where all the testing of electrical and other apparatus for the benefit of fire underwriters of the United States is carried on. The history of Mr. Merrill's engineering work is practically identical with the history of underwriters' inspection and testing since that time. The Underwriters' Laboratories soon outgrew the cramped quarters in the down-town district of Chicago, and were moved to a location on East Twenty-first Street. In 1905 a large model fire-proof building was erected at East Ohio Street on the lake shore. The Underwriters' Laboratories, Inc., of which Mr. Merrill is the secretary, is the testing station of the National Board of Fire Underwriters. Its purpose is to examine and test all devices and materials affecting the fire hazard. The principal work of this institution is the testing of fire extinguishing and retarding devices, but an important department is devoted to the testing of electrical fittings. It is the best equipped laboratory plant of the kind in the world, and is constantly extending its work through affiliation with important insurance organizations, manufacturers' associations, municipal departments, and man-

ufacturing companies. Mr. Merrill is also secretary of the National Fire Protection Association, which includes in its membership all of the insurance boards and organizations in the United States and Canada, as well as the American Institute of Architects, American Society of Mechanical Engineers, American Water Works Association, and other national societies. It compiles all of the rules of the National Board of Fire Underwriters covering fire protection subjects, and is the most important organization engaged in engineering work affecting the insurance interests. He is also secretary of the committee of consulting engineers of the National Board of Fire Underwriters, having in charge for that body the engineering work covering gas, oil, and all hazards except electricity. He is chief electrician of the Electrical Bureau of the National Board of Fire Underwriters, supervising the electrical inspection service in twenty Central Western States and Territories, and having in charge the compilation and publication of the quarterly reports of electrical fires for the United States. Mr. Merrill is also a member of the electrical committee of the Underwriters' National Electric Association and of the National Conference on standard wiring rules, which organizations have in charge the compilation of the National Electrical Code.

—Henry M. Hobart has, in collaboration with Henry W. Turner, published through the Messrs. Whittaker, of London and New York, a volume entitled "The Insulation of Electric Machines." The book contains 297 pages, including the index. This is a most timely contribution to electrical literature, and the authors are to be commended for their efforts to bring together and systematically arrange the scattered literature of this most important subject. Among the subjects considered may be noted the general discussion of the properties of insulating materials, including the effects of moisture and temperature, the effect of varying thickness and Baur's law for "electric breaking strength," and the influence of the shape and size of the electrodes used in testing. In Chapter III. the insulation of "magnet wires" is considered. Chapter IV. is devoted to Stemmetz's investigation of the disruptive strength of insulating materials. In Chapter V. the insulating properties of mica and mica compounds are fully discussed. Insulating materials for bushings, terminal blocks and flanges, and commutator insulation are treated of in Chapters VI. and VII. The subject of in-

ulating varnishes, paints, and impregnation materials, oil for insulation, and the testing of liquid insulators occupy Chapters X. and XI. The insulation of these materials, such as paper and impregnated fabrics, are treated in Chapters XII. and XIII. The application of the various materials to machines is considered in Chapters XIV. to XXII., inclusive. A valuable bibliography is to be found in Chapter XXIII.—W. M. Duane has recently been appointed chief engineer of the Cleveland, Cincinnati, Chicago & St. Louis Railway Company and the Peoria & Eastern Railway Company.

1890.

GEORGE L. GILMORE, *Sec.*, Lexington, Mass.

Professor W. Z. Ripley, of Harvard, left March 2 for Europe. He will study industrial conditions, and return to Cambridge about September 1. Ripley was one of the speakers at the dinner of the Massachusetts Reform Club in Boston, February 2.—Charles Hayden has been elected a director of the Republic National Bank of Boston.—John Dearborn, who was a member of the class in its early days, is secretary of the Puritan Club of Boston.—Major Hayden was chairman of the committee at the banquet of the Real Estate Exchange at the Somerset, February 27.—H. B. Roberts is with the Reinforced Cement Construction Company at 10 East 23d Street, New York, N.Y.—Charles Neave is counsel for the General Electric Company, and also for the American Telephone and Telegraph Company.—Allan Rogers is now permanently located in New York as assistant superintendent of mines of the Guggenheim Exploration Company.—George A. Sonnemann and wife sailed for Europe early in February for a four months' trip.—Darragh de Lancey is now at Waterbury, Conn., as manager of a branch of the buckle trust. Darragh recently underwent an operation for appendicitis, which was most successful, as he was out two weeks later.—George W. Fuller is travelling in Europe.—Mrs. Ellen H. Richards was entertained at the home of Mr. and Mrs. Calvin W. Rice, '90, in Montclair, N.J., on the occasion of her visit to that

city February 1, to give an address before the Woman's Club. In the evening Technology graduates living in Montclair called informally to greet Mrs. Richards: Mr. P. H. Thomas, '93, and Mrs. Thomas; Theo. T. Dorman, '93, and Mrs. Dorman; Warren C. Taylor, '02, a cousin of Mrs. Richards's, and Mrs. Taylor. Others invited, but unable to attend, were: Mr. H. J. Conant, '87, and Mrs. Conant; Chester H. Wells, '02, and Mrs. Wells; Dr. Ethel B. (*née* Blackwell) Robinson and Mr. Robinson. Mrs. Richards wore a beautiful silver-gray silk, with the other Tech color of cardinal ribbons at the throat, in keeping with the occasion. Appreciation of her was also shown two days previous in a reception tendered to her by Miss Margaret A. Maltby, '91, and others at the Women's University Club, Madison Square, New York. About twenty Technology graduates met at dinner on this delightful occasion. Calkins, '90, was toastmaster, and responses were made by nearly all present. Mrs. Richards gave the history of her connection with the institution of coeducation at Technology, which is of especial interest.

1891

HOWARD C. FORBES, *Sec.*, 4 State Street, Boston.

The death of Theodore Spencer is noted elsewhere in the REVIEW. —Fred A. Wilson (J. T. Wilson & Son) has been constructing, as general contractor, the million-dollar residence at Pride's Crossing, Beverly, for Henry C. Frick, of Pittsburg. The magnitude of this establishment is indicated by the fact that the automobile station and power house cost \$55,000, and the fence alone costs \$111,000. An excellent account of the building was given in the *Lynn Item* of Feb. 1, 1906. Wilson has been the general contractor, and several other Institute men have also been connected with the work, as follows: Leonard C. Wason, '91, of the Aberthaw Construction Company (concrete); W. I. Palmer, '91, of Palmer, Parker & Co. (lumber); Clifford M. Tyler, '91, of the Boston Tile and Mantel Company; F. W. Lord, '93, of the Lord Electric Company; and Frank A. Pirie, '05, who has been an assistant to Mr. Wilson.

—Every '91 man should make an effort to come to the reunion in June, which will be our fifteenth anniversary. A special programme will be arranged. Don't make any engagement for Monday, Tuesday, and Wednesday, June 4, 5, and 6.—F. W. Fuger is located at the Agricultural College, Michigan, as professor of military science. He writes that he has about 450 men to instruct, and finds the work very congenial; also, that this is his first service away from his regiment in nearly fifteen years.

1892.

PROF. WILLIAM A. JOHNSTON, *Sec.*, Mass. Inst. of Technology,
Boston.

The present address of a number of men who have made a change in their location since the last register of graduates was issued follows: C. A. Beal, 19 Ocean Terrace, West Lynn, Mass.; C. H. Bigelow, 515 N. Texas Building, Dallas, Tex.; R. D. Chase, 59 Fourth Street, New Bedford, Mass.; G. E. Dadmun, 20 Wall Street, New York, N.Y.; J. F. Johnson, 32 Board of Trade Building, Montreal, P.Q.; W. H. Lane, 173 Kennebec Street, Portland, Me.; E. G. Manahan, 3212 Harvey Avenue, Cincinnati, Ohio; W. H. Messenger, 21 Municipal Building, Brooklyn, N.Y.; H. R. Moody, College of the City of New York, New York; F. C. Moore, 125 Trumbull Street, Hartford, Conn.; F. E. Perkins, 1133 Broadway, New York, N.Y.; H. M. Phillips, Halstead Street, East Orange, N.J.; A. G. Pierce, 176 Federal Street, Boston; A. W. Pierce, 407 Tyler Street, Pittsfield, Mass.; A. G. Ranlett, 400 Rialto Building, San Francisco, Cal.; G. F. Rowell, 16 Exchange Place New York, N.Y.; R. Selfridge, 18 Gramercy Park, New York, N.Y.; F. C. Shepherd, 1 West 34th Street, New York, N.Y.; LeR. K. Sherman, 6128 Lexington Avenue, Chicago, Ill.; Richard Waterman, Meadville, Pa.—George H. Ingraham left Boston in January for an extended trip to the continent. Ingraham expects to combine study with pleasure.—Leonard Metcalf left Boston February 14 for a three months' trip to Puerto Rico.—John A. Curtin was elected, March 12, a selectman of the

town of Brookline, Mass. Curtin conducted a vigorous campaign, and secured a large number of votes.—Charles F. Park, who, as director of the Lowell Institute School for Industrial Foremen, has conducted the work with such marked success, was recently tendered the directorship of the new “Franklin Union,” a name to be applied to the organization which is to administer the funds accumulated from money left by Benjamin Franklin for the benefit of the people of the “Town of Boston.” I understand that Park was asked, by the trustees of the fund, to outline a policy that might be followed by the committee in the discharge of their duties. A study of like institutions was made, and a report was submitted outlining a policy which, I understand, has been adopted by the committee. Park was strongly urged to accept the directorship, but after considerable thought has decided to continue to devote his energies for the benefit of the Institute. This is an example, not infrequent at the Institute, of men on the instructing staff being tendered attractive positions which would take them away from the Institute, but who have refused these positions, continuing to devote themselves to the cause of their Alma Mater. It is hoped that in due time such unselfish devotion will be suitably rewarded.

1893.

FREDERIC H. FAY, *Sec.*, 60 City Hall, Boston.

It is our sad duty to announce the recent sudden deaths of two members of the class, Frederick T. Towne and Henry T. Woods. Fred Towne will be remembered as one of the most popular, most genial, and best beloved men in all the class; and in his later life, as general superintendent of the Yale and Towne Manufacturing Company of Stamford, Conn., he accomplished notable work for the welfare of his employees, and by them was held in an esteem such as we who knew him earlier can appreciate. Harry Woods was of a retiring disposition, and was, perhaps, less widely known than Towne; but at the Institute and at Harvard, where he graduated later, he had a wide circle of friends who realized his sterling worth. In the

passing away of Towne and Woods the class loses two of its most loyal members. Accounts of both of these men will be found elsewhere in this number of the REVIEW.—Frank S. Badger is engaged in hydraulic engineering work on the Pacific coast, being associated with Samuel Storrow, with headquarters at 1021 Shreve Building, San Francisco, Cal.—George S. Barrows is manager of the appliance department of the Wyandotte Gas Company, Kansas City, Kan., his home address being 222 West Armour Boulevard, Kansas City, Mo.—A letter recently received from Denver, Col., bears the heading “Maurice B. Biscoe and Gordon, Tracy & Swartwout, Architects, 244 Fifth Avenue, New York, and Commonwealth Building, Denver.” Biscoe writes: “I expect you will be somewhat surprised to notice my new location. As you will see, I am associated with Gordon, Tracy, and Swartwout in their work out here in the West. Just now we are occupied in erecting the cathedral of ‘Saint John in the Wilderness’ here in Denver.”—Samuel N. Braman is salesman for the Westinghouse Machine Company, of 10 Bridge Street, New York City.—Nathaniel R. Craighill is at present engaged in preliminary work for the Miami Light, Power, and Traction Company, 203 Orchard Avenue, Lebanon, Ohio.—Carleton E. Davis, recently in Panama in the employ of the Isthmian Canal Commission as engineer of water-works and sewers, has returned to this country, and is now department engineer of the Reservoir Department, Board of Water Supply, City of New York.—Samuel D. Dodge is assistant engineer with the Board of Water Supply of New York City, and is at present located at New Hamburg, N.Y.—John Church Hawley, civil engineer in the Quartermaster’s Department, United States Army, is now stationed at Fort McIntosh, Laredo, Tex.—Arthur H. Jameson is superintendent of the steel castings department of the Malleable Iron Fittings Company at Branford, Conn.—George L. Mirick is engaged in real estate business at 293 Washington Street, Boston.—Henry A. Morss has recently been elected commodore of the Corinthian Yacht Club of Marblehead, he having served the club last year as vice-commodore. Of his election the Boston *Herald* said:—

The newly elected commodore, Henry A. Morss, is well known in yachting. He began sailing yachts when a boy, and by constant practice has developed into a well-seasoned amateur. He raced the "Cossack" around Nantucket Shoals Lightship, and has taken part in local racing for years. He is well fitted to be the head of this popular club.

In the sixteen years that he has been connected with yachting Morss has come to be recognized as one of the most progressive yachtsmen on this coast. He joined the Corinthian Yacht Club in 1890, the Eastern Yacht Club in 1897, and the Boston Yacht Club in 1902, when the old Burgess Club of Marblehead, of which he was a member, was merged with the Boston. Morss's standing in American yachting circles is shown by the fact that he was one of the two Americans selected to represent this country at the international conference of yachtsmen in London last January; but at the last moment it was decided that American yachting interests should not be represented at this conference, so Morss remained at home. In addition to active work in the Corinthian Club, Morss has served for two years on special committees of the Eastern Club to arrange ocean races, and he is now on a committee to revise that club's fleet routine. He has owned three well-known boats which have been noted for their smart upkeep and good handling. His first boat was the 21-foot knock about "Aspenet," which was followed in 1900 by the 25-footer "Brigand," and she in 1902 by the fast 35-foot water-line cruiser "Cossack." The latter will be retired this year by a new schooner yawl which he is having built at Lawley's from Clinton H. Crane's design. This new flagship of the Corinthian fleet will be called "The Dervish," and will be 85 feet over all, 55 feet water-line, 18 feet beam, and 10 feet 6 inches draught. Commodore Morss has raced all his boats with spirit. He is an enthusiastic deep-water sailor, a navigator, and a good disciplinarian aboard a racing yacht.—A detailed account of the Belle Fourche irrigation works, South Dakota, is to be found in an article by Walter W. Patch, published in *Engineering News* of Feb. 22, 1906. Patch, as engineer in the United States Reclamation Service, has charge of the design and construction of a considerable part of this important undertaking,

and mention of his work was made in the January number of the REVIEW.—The present address of Edward A. Porter is R. D. No. 2, Hubbard, Ore.—Professor Charles M. Spofford, of the Brooklyn Polytechnic Institute, read a paper on structural steel making, in January, before the Brooklyn Engineers' Club.—Walter I. Swanton has a young daughter, born March 15.—The following account of the remarkable work of Cadwallader Lincoln Washburn, who was with the class for a time as a special student in architecture, appeared in the New York *Herald* of March 18:—

There is now being exhibited in the galleries of A. C. Frederichs, in West Fifty-seventh Street, a collection of paintings and etchings, the interest in the intrinsic merits of which, on the part of the art connoisseur, is rivalled only by the even greater interest in the personality of the artist.

His name is Cadwallader L. Washburn, the scion of an old and well-known family, and a wealthy young man to boot. But up in the Sixty-seventh Street studios, where he etches and paints from daylight to dark, they call him the "Silent Artist." No one in all that busy artists' beehive works so passionately or so unceasingly as he. From the time the winter's light has crept up from the Park slopes on the east and grown strong enough to peer through his ground-glass skylight until the moment the last lingering ray has failed at evenfall Cadwallader Washburn has sat at his easel or his etching board, with never a sound to break the stillness save the plushing of his damp brushes upon the canvas or the delicate scratching of his etcher's point.

And yet the stillness that pervades his studio is not disturbed for Cadwallader Washburn by even such gentle sounds as these. A deaf-mute since the age of three, the "Silent Artist" knows no sound save the spirit voices of the men or women whom he idealizes upon canvas or shadows forth in tender outline from the surface of a mere bit of copper.

And yet, in spite of his affliction, there is probably no artist in all that life-loving and life-living profession who lives a fuller life, or one filled with a greater variety of enjoyment, than does Mr. Washburn. When his work-day is over, he diverts himself with society. Since his early childhood he has been an indefatigable traveller. He has been everywhere, all over Europe a score of times, to the Orient, across the Himalayas, and down into the heart of Africa. And always he has been on the lookout for material, the very essence of which he is now presenting in his first public exhibit in this country.

Since he was a very small boy, the "Silent Artist" has been devoted to his work. His first training he received at the Massachusetts Institute of Technology, where he perfected himself in the principles of architecture. Later he became a pupil of William M. Chase here in New York, and from Chase's hands he went to Spain to learn what he could from Joakim Sorolla, and then to France, to become at last the pupil of Albert Besnard, and after Besnard to exhibit annually in a long series of brilliant Paris salons, extending from the year 1896 until 1904 without intermission.

How can a man deprived of the sense of hearing and denied the power of vocal expression master the difficulties incident to learning the technique of an art which essentially requires an almost incalculable amount of individual instruction, and which is of all arts the one that can be best perfected by the wise and judicious criticism of other artists? The answer to this question constitutes one of the principal factors which argue for Cadwallader Washburn's genius. Work, an almost superhuman amount of work, is implied in that answer; for no eager art student has ever benefited more by exchange of ideas with his fellows or from the golden grain of counsel let fall in chance moments by his teachers and masters than has the deaf-mute artist, Cadwallader Washburn.

Always Mr. Washburn has been the life of his coterie of fellow-students, nor did he ever so much as miss the normal senses of speech and hearing. By written word he has been able to keep in the closest communion with the spirit of any and all occasions. In a deft, quick hand he transfers his remarks and inquiries, his theories and his jests, upon the small writing pad that is always in his hand, and his inalienable amanuensis and secretary just as quickly transcribes for him the crossfire of conversation going on around him.

Being asked if he had not found the absence of speech and hearing a serious handicap to the pursuit of art, Mr. Washburn is quoted as saying:—

"Yes and no. Never having known the advantages of speech and hearing I am equally ignorant of their necessity, and I am not conscious, consequently, of any handicap existing. Besides that, I believe that I am more than compensated for their loss by a greater acuteness of my other senses. Sight and touch being my only artistic instruments, I have been compelled to develop them beyond what might have otherwise been the case. I have been obliged, in other words, to make them each do double duty, and I fancy that

my hand is a surer hand and my vision a more precise instrument than they would be, had I the power to hear and speak. And certainly my theory is not at variance with the observations of biological science, which teaches us most unforgettably the law of compensation. At least it has been a comfort, and I may say something of an inspiration, to me to believe that, because Nature has deprived me of two of my senses, she was likely to expect me to make more than a normal use of those she did mete me out."

1895.

WILLIAM T. HALL, *Sec.*, Mass. Inst. of Technology, Boston.

François E. Matthes writes from California as follows:—

It may be somewhat of a surprise to my friends to find that, notwithstanding the announcement made in the *REVIEW* of my coming to the Institute this winter, I am, after all, out here on the other edge of the continent. However, life with the Geological Survey is full of uncertainties. It seems almost useless to do any planning. Also, to confess it, I am still enough of a nomad to enjoy that sort of an existence.

The new survey of the Yosemite Valley, which I took up last summer, did not progress as fast as was anticipated, the main impediment being the dense smoke from neighboring forest fires. These continued to smoulder along for nearly five months, from June until the end of November, in spite of the efforts of the military patrols of the Yosemite National Park. The snow-storm that finally put them out, put me and my crew out, too. We beat a hasty retreat to Merced, reaching the great, balmy valley of California just in time to avoid a second and much severer storm, which, I am told, smothered the Yosemite under some four feet of snow,—enough to have kept my outfit from getting out of the Sierras this winter. In the mean while the new Yosemite Special Sheet is only partly finished, and I am at the Sacramento office of the Survey this winter until spring returns and enables me to resume my work in the mountains.

I do not recall a more enjoyable summer than the one I spent clambering around in the Yosemite Valley. The weather remained immaculate for months at a time, making camp life a real pleasure. No wonder that Californians delight in camping trips! Half the State lives under canvas every summer, and they certainly know how to go about it. Just the same, I noticed that my survey camp, with its many conveniences and pseudo-mil-

itary aspect, was a good deal of a revelation. With most people, living in camp means wallowing in dirt. But a topographer, you see, is primarily a man with clean hands. He has to keep the same piece of paper going for the better part of two years, and the more he rubs it, the quicker it collects dirt again.

Beside the Grand Canyon of the Colorado, the Yosemite is an insignificant gorge. Many of the valleys I have mapped in the Montana Rockies easily surpass it in grandeur and coloring, but nowhere have I found a more fascinating and romantic spot, with so many superlatives within so small a compass. All good Americans should make a pilgrimage to it before they die.

—A. D. Fuller, who is treasurer and manager of the Andrew D. Fuller Company, writes:—

My entire time is occupied in looking after contracting work. We do all kinds of work excepting the superstructure of buildings. Most of it is for private parties, and comprises earthwork, excavation, grading, cellars, foundations, roads, dams, bridges, and, in short, anything requiring the handling of earth, masonry, rock, concrete, or water. For our Southern work we have an office in Greensboro, N.C., where C. A. Sawyer, Jr., '02, is resident manager. In regard to the Technology Fund, '95 has shown a creditable response; but it would be more satisfactory if every member subscribed something, no matter how little, thus indicating in a substantial way to the Corporation that he is interested in the support of the Institute, and that he appreciates the act of the Corporation in requesting the participation of the alumni in the administration of the affairs of Technology.

—R. W. Carr (Course III.) states that he is "making a living and enjoying life. A boy arrived at our house three months ago, and, not being able to think of a better man, I named him after—Yours truly."—A. E. Zapf, who is business manager of the *Technical World Magazine*, writes:—

The magazine is not everything that I would have it, but it is a slow and thankless task to educate the world, and, when you are doing it to the tune of about \$8,000 a month, as the magazine costs, some ideals have to be set aside for sordid money to meet bills. We have 100,000 circulation, and the magazine is just a little over two years old. This shows that there is a

real interest and demand for the kind of thing we are trying to do, but a magazine, to be successful, must have at least 150,000 circulation; and, to get this amount of circulation, it must be popular, and this is what we are aiming to make of the magazine,—a popular magazine with a technical turn, something for the man who likes to know “how” and “why” things are done and to get the information without working too hard for it. Send along your suggestions just as soon and just as freely as you can. We are going to have a great annual Tech dinner here February 24, and Harry Tyler is going to come on and speak to us.

—W. C. Marmon, of Indianapolis, who will be remembered as an active member of Course II. and a man who did a great deal in bicycle track events when at Tech, is now engaged in the manufacture of automobiles. Marmon spent the week of the auto show in exhibiting his car in New York.—W. S. Williams recently read a paper before the New England Section of the Society of Chemical Industry on “Antimony Compounds as Fixing Agents for Tannic Acid.”—D. B. Weston is again at Trinidad, Cuba, in charge of a sugar house there.—The “Decennial Catalog,” which was published in December, shows very plainly that the secretary has very little information with regard to many of the men. He would be grateful to any one who will call his attention to omissions and corrections. The following men have contributed towards the expense of publishing the book, whose names were omitted from the acknowledgment at the beginning of the book: Richard Morey, F. W. Fuller, C. H. Parker, R. K. Sheppard, H. M. Tucker, and C. F. Tillinghast. The Presbyterians were left out of the list of religious affiliations.—Dwight N. Marble died Sept. 8, 1900. His name was omitted from the catalogue.—By an oversight, half of F. A. Hannah’s history was omitted. He was with the American Tobacco Company from 1900–01, consulting engineer in New York from 1901–02, and with the Crosby Steam Gage and Valve Company to date. He is a member of the First Corps of Cadets, M.V.M. (since January, 1904), and of the American Society of Mechanical Engineers, the Technology Club, and the New England Railroad Club. He is “single, but hopeful,” and a “Republican, generally.” Since the above was received, the REVIEW received from Mr. Hannah the following ad-

dress: Care of Stephen T. Williams & Staff, 346 Broadway, New York, N.Y.

1896

EDWARD S. MANSFIELD, *Sec.*, 70 State Street, Boston

The committee appointed at the last annual meeting in June to arrange for the decennial celebration of the class has had several meetings; and arrangements have progressed to such a stage that they can report with a reasonable degree of certainty that the event will take place at Ipswich, near Plum Island, where plenty of room and ample accommodations will be provided to accommodate all who are able to attend, from Friday afternoon, June 1, to and including Monday, June 4. Committees have been appointed to provide entertainment, and arrangements will be made to accommodate all who wish to attend for the whole time or for a single day, at a comparatively low figure. More definite information will be sent out in due season, and the committee urges all men connected with '96 to plan to spend at least a part of this period at the celebration headquarters.—The engagement is announced of Benjamin Hurd, of New York, to Miss Anne Elizabeth Mayer, of Norfolk, Va.—Word has been received that a new candidate for the class of M. I. T., 1930, arrived in the home of E. C. Jacobs, of Burlington, Vt., on March 22.—E. C. Atkins, of Providence, R.I., who holds a position with the Builders' Iron Foundry of that city, was in Boston about the middle of March, visiting friends.—M. L. Fuller, of the United States Geological Survey, will give a course of lectures in April at the University of Chicago, on the hydrologic work of the government.—Stewart S. Bell, formerly superintendent of the municipal light plant in Reading, Mass., has associated himself with the Western Electric Company, as their agent in Massachusetts.—Mr. Charles K. B. Nevin, formerly with Allin & Collins, announces that he has opened an office for the practice of architecture at 6 Beacon Street, Boston, Mass.—E. H. Laws, of Globe, Ariz., spent his vacation of about two weeks in and around Boston during the month of February.—W. D. Coolidge,

until recently Associate Professor in Physical Chemistry at the Institute, has accepted a position with the General Electric Company at Schenectady, N.Y., and is now engaged in engineering and research work.—A. J. Bowie, Jr., formerly electrical engineer with the Northern California Power Company, has accepted the position of irrigation engineer in the United States Department of Agriculture, with headquarters at Washington, D.C.—H. P. Browne has given up his business of production of crude oil in Houston, Tex., and is now with the New York Transportation Company, in the capacity of assistant engineer.—J. L. Coley is now foreman of the United States Rapid Fire Gun and Power Company of Shelton, Conn.—Henry Cummings, Jr., formerly contracting agent of the American Bridge Company, is now the secretary of the Fosburgh Company of Boston.—William T. Dorrance has left Westinghouse, Church, Kerr & Co., and has become assistant engineer with the New York Central & Hudson River Railroad, with headquarters in New York City.—A. L. Drum has left the Indiana Union Traction Company, and has become general manager of the Chicago & Milwaukee Electric Railway.—Henry Gardner has associated himself with the H. K. Porter Company, Forty-ninth Street, Pittsburg, Pa.—Alf C. Lootz holds the position of superintendent of construction with Holbrook, Cabot & Rollins Corporation, Beacon Street, Boston, Mass.—W. H. McAlpine was married to Miss Mary Dudley Gray of Frankfort, Ky., on March 3. After an extended trip through Washington, New York, Boston, and Lawrence, they have taken up their residence in Frankfort.

1897

JOHN A. COLLINS, JR., 74 Saunders Street, Lawrence, Mass.

James W. Smith has been made superintendent at the Trenton Iron Company, Trenton, N.J. Since leaving the Institute, he has been successively assistant to chief engineer and master mechanic at the Worcester plant of the American Wire and Steel Company, and later assistant superintendent and finally superintendent at the

Trenton plant.—A second assistant secretary has appeared in the person of John Oliver Collins, born Nov. 11, 1905. It is possible that with his help the secretary will be able to issue the long-promised Class Book. A circular will be sent to members shortly, calling for an assessment, the second since graduation. This is rendered necessary for several reasons. It was found that there were not sufficient funds by a considerable amount in the treasury to pay for the book issue. Also, there is an assessment of twenty cents per graduate that has been due to the Association of Class Secretaries some time, and which must be paid. There will be a reunion and dinner held at Commencement this year, but for which it is too early to give further notice.—The alumni of the Lowell Textile School who are located in or around New York City held a reunion and banquet there recently. The Textile School was represented by Charles H. Eames, Tech. '97, who is the secretary.—At the annual meeting and dinner of the Technology Club of the Merrimack Valley held in Lawrence on February 2 three '97 men were present, P. M. Smith, Eames, and Collins.

1898

PROF. C.-E. A. WINSLOW, *Sec.*, Hotel Oxford, Boston.

The second informal meeting of the class of '98 was held at the Bürger Brauhaus, on the evening of February 2, with the following members present: Treat, Coburn, Wing, Norton, Perry, Hubbard, Edgerley, Blanchard, Ayres, Godfrey, Winslow, Dawes, Curtis, Butcher, Bennink, Danforth, Richmond, and Putnam. H. T. Williams, '06, very kindly furnished music.—Edgerley has returned to Boston to take charge of the New England Department of the Chilton Paint Company.—Curtis has opened an office as counsellor-at-law at 161 Devonshire Street, Boston.—Gardner is now advertising manager of the *Twentieth Century*, a monthly magazine, of which John Brisben Walker is editor.—Mark E. Taylor is located at the Frankford Arsenal, Philadelphia.

1899.

MILES S. SHERRILL, *Sec.*, Mass. Inst. of Technology, Boston.

Word comes from Harry Babcock that he is still living in Neenah, Wis., and is still numbered among the few of us who are enjoying single-blessedness.—Ed Bergstrom is in California. He has a charming little daughter, and is doing well in the architectural line.—Arthur L. Hamilton surprised his friends in Boston by calling on them on the first of March. He had just come on with his wife and son from Fairbanks, Alaska, where he is interested in various propositions. He brings glowing reports with him of the life in that country. He has been there for over two years, and intends to return in the early fall.—Harry G. Johnson is now located in Bridgeport, Conn., with the Union Metallic Cartridge Company. He reports that there are several Tech men there, as well as graduates of other leading colleges, which makes Bridgeport much more interesting than it would otherwise be.—J. A. Patch writes interesting accounts of his life in the Orient. He has been teaching chemistry at the Syrian Protestant College of Beirût, Syria, for the last six years, having visited America only once in that time. He was married last year, and has his home in a pleasant little villa at Beirût, called "West Point." He has spent most of his vacations in taking trips into the surrounding country, so full of interest both historically and scenically. His wedding journey was to Damascus, and during the summer holidays of last year he and his wife were encamped among the famous cedars of Lebanon, far from civilization. He writes,—

Our servant had to get up at three o'clock every morning and climb down the mountain about 2,000 feet to the nearest village to get our milk, water and food supplies for the day.

Patch has lately been made happy by the arrival of his first-born, a son, Ralph Douglas Patch.—E. S. Phelps is also to be congratulated on the advent of his second daughter, Eleanor Frances.—C. Gardiner Barry is at present in the resident engineer's office of

the N. Y. C. & H. R. R.R., New York City.—Arthur H. Brown, who was formerly located in Washington, D.C., has returned to his native heath, and is now a member of the firm of Bright, Brown & Quinby, patents and patent causes, 53 State Street, Boston. He is looking forward to a renewal of old acquaintances at the June reunion.—William L. Morris, formerly examiner in the United States Patent Office, has recently established an office for himself at 902 F Street, Washington, D.C., as attorney and counsellor-at-law in patents, trade-marks, and copyrights.—William C. Phalen, of the Geological Survey, has returned to Washington.

1900.

RICHARD WASTCOAT, *Sec.*, Dedham, Mass.

Five members showed up at the annual meeting and dinner of the Alumni Association on December 29, namely: Maxfield, II., I. Osgood, II., Russell, I., Southworth, IV., and Wastcoat, I. A very pleasant evening was spent, the only drawback being the small number present. Increasing family cares probably account for it, even if three out of the five present were married men. And, judging from the specimens present, they appear to be standing "the trials of life" better than the bachelors, for Southworth is following in the steps of "John D.," and Wastcoat is getting gray.—Maxfield was married last April, and is keeping house in Dorchester. He is in charge of one of the departments at the Sturtevant plant at Hyde Park.—Osgood joined the ranks of the married men last June, and has a position at the power plant of Lawrence Gas and Electric Light Station.—Russell is married, and has one child, a boy, and lives in Boston. He is instructor at the Institute in hydraulics.—Southworth, after graduating, was in the employ of a number of architectural firms in Boston, his last position being with Shepley, Rutan & Coolidge. Two years ago he passed the examinations for inspector of the new buildings being erected at the Naval Academy at Annapolis, where he is now located. Southworth made a trip up this way to his home in Stoughton over Christmas, which

enabled him to take in the dinner.—Stratton, IV., is also an inspector on these buildings, having passed the same examinations.—N. T. Neill, VI., has severed his connection with the Westinghouse people in Pittsburg, where he has been located since graduation. While with the Westinghouse people, he made a special study of lightning arresters, and has written several articles in connection with this subject.—J. S. Burns, I., who has been located in Salem, has now a position in the engineering department of the Boston Elevated.—L. S. Keith, VI., was in Boston last month on inspection work connected with telephone switchboard installations. He is an expert in this line, and has been connected with the New York Telephone Company since graduation.—C. Corliss, VI., has recently been promoted assistant to the chief engineer of the Boston Elevated. Corliss started in in the electrical department, and has advanced step by step to his present position.—F. D. Chase, I., who has been chief draughtsman of the Minneapolis & St. Louis R.R., and had headquarters in Minneapolis, is now located in Chicago, being connected with the Leonard-Martin Construction Company, 802 Monadnock Building, who are general contractors for warehouses, manufacturing plants, etc. Chase writes that he is very busy, as they have a lot of work on hand and are figuring on more.—Billy Hough, II., has an office in the same building as Chase in Chicago, and is established as W. B. Hough & Co., selling Ransome concrete materials, such as bars, mixers, etc.—C. T. Leeds, IV., who entered West Point at the beginning of the fourth year, is now a lieutenant in the Engineering Corps of the army. The present year he is on leave of absence, and is at the Institute taking the fourth-year studies in the course in civil engineering.—The secretary ran across Billy Stone while on a trip to his home in Taunton last Christmas, and dunned him for news, with the result that he received the following interesting letter:—

Dear Dick,—I received your letter dunning me for some news about the fellows, and will gladly give what little I have.

Searle, I., has complete charge of the engineering for converting the West Shore Railroad from Utica to Syracuse from a steam railroad into an elec-

tric one. Power for this road will be obtained from Niagara, consisting of 600,000 volts.

A. C. Redman, I., for the past three years has been working for the United States Reclamation Service. The first year of his service he had charge of putting in a water-works system and building a jail in Anadarka, Okla., and for the last two years has had charge of building 100 miles of irrigation canal in an alkaline desert of Nevada. He misses the salt-water baths he used to take on the coast of Maine, but probably Instructor Russell's thoughts often wander into that State, even if Marion, Mass., is nearer. (All Course I. men who went on the '99 summer school have tender thoughts of the State of Maine.)

Mayhew, I., the 1900 sprinter, has been doing hydrographic surveying along the West Indies for the last two years, and at present is stationed at the Portsmouth Navy Yard, New Hampshire.

The long fellow of the class has been in charge of road construction during the summer season and road surveys during the winter since 1902. Fifty million will be expended by New York State for good roads during the next few years. (Billy says he hopes to be a millionaire some day.)

The training that one gets in Technology comes into use often in this field of engineering. But much judgment must be used to determine the most suitable and economical foundations for roads. The writer has encountered springs in the seams of ledge rock which must be drained before the macadam can be placed, built roads through cat-tail swamps where 1,500 piles were used for culvert foundations within a stretch of one-half mile, and has also constructed roads through deep quicksands of varying density, where piles could be used in some places and boulders in others for a foundation for the stone. Where the property fences have encroached on the highway, I have forced the fence back to the street line, and have been challenged to fight the abutters. I know personally one engineer who was ordered back from making a survey at the point of a rifle, so am beginning to think, if one stays in the business long enough, Captain Bigelow's Geometry of Strategy might be of advantage.

In cross-sectioning roads in the winter, have run across snow drifts 10 feet deep, when it was necessary to dig a hole 5 feet in depth large enough for one man, and then dig 5 feet more to reach the ground level. Again, at other places where the snow was 10 feet deep, the road could be cross-sectioned easier by aid of a tunnel through the snow drift. The temperature at such times was frequently below zero, and some think that it is "cruelty to animals" to make them work there.

This letter must be getting dry and cold, and will get you to address all letters as below.

Hastily,

W. W. STONE,
Nelsonville, Putnam Co., N.Y.

P.S.—Now the “Doctor” is married, I sincerely hope that he will not get “too gay.”

—The sympathy of the class will go out to Mr. and Mrs. Arthur Burr White in the recent loss of their young daughter, Muriel, who died Feb. 28, 1906, aged ten months and fifteen days. Several months ago she suffered from whooping-cough, which left her in a weakened condition, pneumonia finally setting in and resulting in her death. White is city engineer of Corona, Cal., and has an office at Riverside.—Russell Suter has left the Philippines and returned to the States. His address for the present is care of Col. C. R. Suter, Army Building, Whitehall Street, New York.—Dr. John W. Brown, V., instructor in theoretical chemistry, has accepted a position with the National Carbon Company, Cleveland, Ohio, as head of their research department.

1902

CHARLES W. KELLOGG, JR., Sec., El Paso, Tex.

El Paso seems to be so far from the Institute that hardly any news from members of his class has percolated through to the secretary during the last quarter. He takes this opportunity of reminding any members of the class who may read these notes that he would be very glad to hear from them. During a recent visit to Dallas he met Randall, who is working for the Dallas Consolidated Electric Street Railway, and who seems to be the only other 1902 man in the State.—L. C. Hammond is now resident engineer of the Construction Department of the Big Four Railroad at Miamisburg, Ohio.—F. H. Reed has become assistant editor of the *American Telephone Journal*.—Hervey has left the General Electric Company, and joined the Stanley G. I. Electric Manufacturing Company. His office is at 1543 Monadnock Building, Chicago,

Ill.—It is a sad duty to announce the death of Conrad Wendel, who was killed by the Twentieth Century Limited of the New York Central Railroad at Poughkeepsie, N.Y., on Dec. 27, 1905.—Carleton B. Allen of New York was married March 24 to Miss Marie Rose Schwenter of Thun, Switzerland. They will be at home after June 1 at 30 Colonial Place, New Rochelle, N.Y.

1903

WALTER H. ADAMS, *Sec.*, Polytechnic Institute, Brooklyn, N.Y.

The secretary has been busy since January preparing the class register. A number of letters came in too late to be published, and the corrections will be published in the July number of the REVIEW. Some more members of the class have renounced the jolly bachelor life, and are trying double harness. Bartlett was married to Miss Alice Julia Farnham on Sept. 22, 1905.—Cushman was married to Miss Ivah J. Richardson on Oct. 4, 1905.—Doran was married to Miss Sara Cecilia McNiff on Sept. 19, 1905.—Gilker was married to Miss M. B. Jackson, of Pawtucket, R.I., on June 15, 1905.—Hickok was married to Miss Jessie E. Stevens on June 28, 1905.—Ricker was married to Miss Annie Henderson Graham on April 12, 1904, and Sibbett was married to Miss Mary L. Harding on Sept. 22, 1904.—The class baby has appeared, and at this writing seems to be George Ewing Sibbett, Jr., who was born June 22, 1905.—Some other members of the class are proud fathers. Carlisle has a little boy; Ferris, a little girl; Gleason, a boy; Ricker, a girl; and Whitehead, a girl.—Whitehead has gone into business for himself under the name of C. Whitehead & Co., and is manufacturing chemical colorings.—Regan received his A.M. at Harvard in 1904, after studying mathematics a year.—Doran writes that he was in Europe from March to September of last year, visiting England, Wales, Isle of Man, Belgium, and France. The trip was a business one, as he introduced his hat machines there.—You mustn't say "labor union" to Hewitt Crosby. At present he is foreman for a firm of New York contractors who are trying to break

a strike. He says he prefers to stay in the house nights, as the night air might be too penetrating.—It is my sad duty to record the death of another classmate: Stanley Lester Porter, of Middleboro, died on Nov. 1, 1905, of tuberculosis. He will be remembered by the members of Course XIII.

1904.

CURRIER LANG, *Sec.*, Michigan Central Depot, Detroit, Mich.

Since the last issue of the REVIEW, the secretary has been enabled to discover in his native haunts the only and original member of M. I. T. '04, in South Africa, and to wring from him, at great risk to life and limb, the following account of his doings:—

JOHANNESBURG, Jan. 19, 1906.

I have been out here now about four months, getting here the middle of September. I had a swell trip down here on the steamer. I tell you, it is a good deal better to travel first-class and have everything done for you than it is to travel on a fruit steamer, and sling oil for your living.

Much to my surprise and that of all my friends, I graduated last June from M. I. T., and at once accepted this position. Before coming here, I spent six weeks in New Jersey with the Manhattan Rubber Company, Robins Belt Conveying Company, and with the New York Lubricating Oil Company. Then I lit out for the unknown. I came first to England, and from England to Cape Town, and thence to Johannesburg by rail, the whole trip being a little over 10,000 miles.

My first impression of Jo—burg was that it was the dustiest place I had ever seen, and that first impression still holds good. The Main Reef runs right through the city, and stretches out about 30 miles on each side. The winds out here get a hold of the waste dumps, and scatter them gently over the whole city. It is not so bad now in the summer, for it is the rainy season; but, when the dry season comes, it is fierce.

The firm with whom I am employed is Frazer & Chalmers, and they are probably the largest firm in South Africa dealing with mining supplies. Mr. B. M. Mitchell, who is the assistant manager, graduated from Tech in 1893. Mr. Park, the manager, is also an American. There are a great many Americans here, the greater proportion of the consulting engineers and mine managers coming from the States. I went to an American college dinner

about a month ago, and there were twenty-seven different colleges represented.

My work at present is mostly in connection with lubricating oils and belting, packing, etc. I am out on the Reef, visiting the different mines, etc., almost every day. In order for me to get around quickly, the firm have bought me a large motor cycle on which I expect to break my neck sooner or later. I find my work very interesting and not in the least tiresome. After I have been out here a year, it will be better than ever, as it will be more varied.

There is one thing about this country which I am not struck on, and that is the price of everything. Eggs cost \$1 a dozen. You can't get decent board under \$50 a month, and a small room costs \$20-\$25 a month. Clothes cost the same as in the States.

Most of the get-rich-quick schemes out here consist in buying shares, and then selling them for about one-half what you paid for them. None of that for me.

If any of this is printed, kindly send me a copy, as it will be the first novel I have ever had published.

As ever,

J. A. PITTS.

—The following personal notes concern members of the class: F. M. Pierce and A. M. Deane are both with the Penn Bridge Company at Beaver Falls, Pa., Pierce having left the Atlas Engine Company of Indianapolis, and Deane having left the Central States Bridge Company of the same place. Deane is thinking seriously of returning to Tech in September to finish his course.—A. W. O'Connor is with the American Bridge Company in Trenton, N.J.—Lee Phillips has left Francis Bros. & Jellett, Inc., of Philadelphia, and gone with French & Hubbard, consulting engineers, Boston.—J. L. Hecht reports that a son was born to him on Dec. 15, 1905, and wishes to know if he is the winner of the loving-cup that the class promised to award to its first-born son. This is a matter to be dealt with at the time of the annual dinner and meeting, and due notice will be given to applicants for the honor, and the conditions of the race will be made known.—H. E. Thompson was married on Tuesday, November 21, to Miss Mabel Anne Tracy at South Coventry, Conn.—H. A. Whitney, after graduation, went directly to Portland, Ore., and took charge of the draughting office of the

Lewis and Clark Fair Commission. This work ended last August, and since that time Whitney has had charge of the office of Whidden & Lewis, architects, of Portland. The following extract is from an account in the *Portland Evening Telegram* of October 14:—

Miss Mary Paulus, only daughter of Mrs. Mary A. Paulus, was married Tuesday evening, October 10, at eight o'clock to Harrison A. Whitney at the residence of the bride's mother. The simple ring ceremony was performed by Rev. J. Whitcomb Broughton, D.D., pastor of the First Baptist Church. Only relatives were present, and there were no attendants. The decorations in green and white were exquisite. They consisted of white carnations and Oregon grape, and the bay window, where the bridal party stood, was decorated with white mull. The bride was very beautiful in a gown of crepe de Paris over white taffeta. Her veil was festooned with orange blossoms. From 8.30 to 9.30 a reception was held, which was largely attended. The bride is a favorite in social and musical circles, and she has been a valued member of the choir of the White Temple. The groom, a prominent young business man, is a graduate of the Boston School of Technology. Mr. and Mrs. Whitney will reside at 1203 E 9th Street, where they will be at home after November 15.

—F. S. Anderson is with the Kelsey Gold and Silver Mining Company at Placerville, El Dorado County, Cal., a town of 2,400 inhabitants, at an elevation of 1,900 feet. Anderson is growing up with the town, although he was about six feet three when he left Tech.—A. D. Smith is employed by the Standard Oil Company at Bayonne, N.J. He is in charge of the laboratory, and is foreman of the Inspection Department, which controls the quality of the finished oil.—The secretary has left the Pittsburg district and the employ of the Pennsylvania Lines, and gone to Detroit, Mich., to assist in the construction of the Michigan Central Railroad's tunnel under the Detroit River. This is a two-track tunnel, and, including the approach tunnels under the land, is about 12,000 feet long, and will probably require three or four years to build.—H. A. Hill has left the Pennsylvania Lines, and gone to work on the construction of the city of Pittsburgh's filtration plant at Aspinwall, Pa.—The other '04 men doing engineering work on this large un-

the Buffalo Works of the Calumet & Hecla. Houch, Morse, and Marcy are still located as reported in the October REVIEW. Grove says:—

The bunch has got together on several occasions at some of the fellows' rooms or at the Tech café (for sake of the name), at the theatre or even at the skating rink. Chesterman was with us for a month while investigating the long-distance telephone situation, and stirred us up to excitement and several good times. Billy Spaulding represented '05 at a luncheon given Dr. Tyler by the alumni on his visit here.

—A letter from Cowper reads:—

Dear Bob,—I am sending my pledge to you so as to drop you a line at the same time, and thus save a two-cent stamp. Your dunning letter is O. K. Send out another, and give the fellows h—I who don't ante-up. I am plugging away in the testing department of the Standard Steel Works, and like the work very much.

—It would help us out with the REVIEW news a lot if more fellows would drop us a line, as "Cowp" did, and tell us some news. If not about yourself, about some other '05 man.—Belding writes from Claremont, N.H.:—

Nearly all the fellows have gone away. As you remember, I came up here with Joe Brown and Arthur Freeman. Freeman was sent to Salt Lake City, and is out there now in the company's office. That office is run by Matt Brodie, an old 1902 man. Brown has just been sent to Chicago to the company's office there. We are all in the sales department. Charlie Smart came up here about Thanksgiving time, and has charge of the premium work. This is a dandy little town, and the company is a corker. I heard from Louis Robbe, and he has been down in West Virginia for two months for his company.

—We hear from Walker in Philadelphia:—

The first Tech man we saw was Edward Snow, who has since returned to Tech. Then came H. G. McVay, then with the Lanston Monotype Machine Company, but now with the Winthrop Press of New York City. We hunted up William Houskeeper, and not only found him, but also Wallace

MacBriar. Then Robert Morse walked in on us. He is designing a concrete asphalt plant to go on one flat car. Bill Keen is also here in Philadelphia. Ernest Calkins has had to go home, as he was very sick with typhoid fever. Next came Fred Goldthwait and Maurice Landers to take positions with the Lanston Company, and then "Big Bill" Gerry with the Baldwin Locomotive Works. On January 12 five of us attended a meeting of the Technology Club of Philadelphia, at which nineteen Tech men were present. We enjoyed meeting the older men, and passed a very pleasant evening. From the January REVIEW we located Lewis Killion, of banjo fame. We had had no general gathering, but the announcement of the '05 dinner was the signal for a general gathering, with the result which you know. After that we agreed to meet every two weeks, and with the song book and Killion at the piano we recall old times at the Union. We also took up the question of the Income Fund, and trust that you have heard from all of us. We then organized the "Society of '05 Quakers," and after due formalities Bill Keen was elected to the office of "William Penn" and Walker to that of "Fountain Penn." We would suggest that, whenever Tech men find themselves in the same city, if one will but start, the others will co-operate in any similar scheme. Try it!

City Editor, TECH REVIEW,—Here are a few items for your journal. It seems to be hard to connect with many fellows here that you have not already got. F. H. Payne, Otis Elevator Company, 17 Battery Place, New York; Elliott Lum, Telephone Engineering Department, Western Electric Company, New York; A. P. Gerry, Phœnix Engineering Company, New York; R. N. Whitcomb, with J. G. White & Co., Engineers, 94 Exchange Place, New York; H. M. Wilcox, with J. W. Ferguson Company, Paterson N.J. In haste this time.

ROS DAVIS,
New York Correspondent.

—The next '05 gathering will be at the "Pops" on June 5th. Notices will be sent out later. At the time of writing '05 has eighty-eight subscriptions to the Alumni Fund. Every one take hold, and help it along. We are still behind '04.—The first alumni dinner of our class was held at Marliave's, on Bosworth Street in Boston, on February 23, and certainly was a credit to the class. There were seventy-one of the fellows there, and every one had a

"bang-up" time. Incidentally, this was the largest class dinner of alumni ever held. One of the best features of the dinner was the large number of men who were with us one or two years, and whom we had not seen for some time, and all still red-hot for 1905.—During the dinner a letter was read from the '05 crowd in Philadelphia, saying that they were having a '05 dinner there at the same time, and just as we were breaking up a telegram came in from there, signed "Walker, Killion, Goldthwait, Landers, Eichler, Gerry, Keen," which showed the way our men hang together, and brought out the '05 yell for the Philadelphia crowd. As is the custom at the first dinner, a salary vote was taken up, which showed an average of \$72 a month. Nineteen were getting \$60 a month, eight were getting \$100 or over, and three under \$50. Mr. I. W. Litchfield, of the class of '85, and a member of the Income Fund Committee, spoke upon the purposes and progress of the fund, and, although interrupted several times by the "cuckoo" clock, made such an impression that forty-eight pledges were handed in during the evening. Mr. Litchfield said particularly that, although they wanted as large subscriptions as possible, they wanted especially something from every one, no matter how small it was. After dinner the crowd sat around, and sang and talked until about eleven. There was quite a piece about the dinner in the *Post* the next morning. ("Perk" is on the *Post* now.)—Following is a list of men who have changed their addresses since the last REVIEW was published:—

Fred H. Abbott (VI.), Houghton, Mich.

With Houghton Electric Light Company.

Roy H. Allen (III.), Santa Maria del Oro, Est. de Durango, Mexico.

With Lustre Mining Company.

Claude A. Anderson (XIII.), 11 Charles Street, Quincy, Mass.

Draughtsman.

George H. Barrows (IV.), 213 W. Newton Street, Boston, Mass.

Post-graduate Student at M. I. T.

William H. Beers, Jr. (VIII., VII.), 16 Trinity Street, Hartford, Conn.

With Henry Souther Engineering Co., 440 Capitol Avenue.

William P. Bixby (II.), 23 Grove Street, Pawtucket, R.I.

M. E. Department, Howard & Bullough, American Machine Company.

- Edward M. Coffin (X.), Box 441, West Seneca, N.Y.
With Lackawanna Steel Company.
- Richard V. Collins (I.), Mifflin, Pa.
Engineering Corps, M. W. P. R.R.
- Charles A. Emerson, Jr. (XI.), American Building, Baltimore, Md.
Chemist and Bacteriologist with Sewerage Commission.
- Luther E. Gilmore (X.), P.O. Box 671, Branford, Conn.
- Fred W. Goldthwait (II.), 1835 No. Park Avenue, Philadelphia, Pa.
With Lanston Monotype Machine Company.
- Carl H. Graesser (II.), Wallingford, Conn.
Economist for International Silver Company.
- Thomas McC. Gunn (XIII.), P.O. Box 104, Orono, Me.
Instructor Marine Engineering, University of Maine.
- Reynold M. Harding (I.), Greencastle, Ind.
With Division Engineer, Big Four Railroad.
- Henry L. Hardy (I.), 414 Columbus Avenue, Boston, Mass.
With Boston & Albany R.R., Engineering Department, Boston.
- Myron Helpert (V.), 39 Clinton Street, Springfield, Mass.
Chemist with Chapman Valve Company.
- Edgar L. Hill (II.), Lincoln, Ill.
With American Steel & Wire Company, Worcester, Mass.
- Arthur H. Howland (IV.), 105 Gates Avenue, Brooklyn, N.Y.
With Clinton & Russell, 32 Nassau Street, New York.
- William H. Humphrey (IV.), 171 W. 97th Street, New York, N.Y.
With Dureen & Co., New York.
- George Jason, Jr. (II., VI.), 9 Winthrop Street, South Framingham, Mass.
Night Manager, Brookline Office, New England Telephone & Telegraph Company.
Married April 21, 1905, to Olive H. Stewart, of South Framingham.
- George B. Jones (II.), West Seneca, N.Y.
With Lackawanna Steel Company, Merchant Mill.
- Harry C. Kendall, 216 N. Second Street, St. Louis, Mo.
With Westinghouse Electric & Manufacturing Company.
- Herbert W. Kenway (XI., II.), Room 312, United States Patent Office,
Washington, D.C.
4th Assistant Examiner.
- Charles D. Klahr (II.), 371 West 120th Street, New York, N.Y.
Mechanical Engineer with Westinghouse, Church, Kerr & Co.
- Eugen F. Kriegsman (I.), 876 Federal Building, Chicago, Ill.
United States Geological Survey, Hydrographic Aid.

Maurice B. Landers (II.), 601 North 18th Street, Philadelphia, Pa.

With Monotype Company.

Harry M. Lynde (I.), 135 William Street, New York, N.Y.

Corps of Engineers, Commission of 20, National Board Fire Underwriters.

Ralph H. Nesmith (XIII.), 4808 Chester Avenue, Philadelphia, Pa.

Navy Yard, Pa.

Galt F. Parsons (VI.), 94 St. Botolph Street, Boston, Mass.

Student M. I. T.

Harry S. Percival (VI.), 349 Columbus Avenue, Boston, Mass.

Student M. I. T.

George W. Perry (XIII.), P.O. Box 133, Ashland, Mass.

With Lombard Water Wheel Governor Company.

Grafton B. Perkins (V.), 203 Lafayette Street, Salem, Mass.

Advertising solicitor, Boston *Post*.

Waldemar S. Richmond (I.), Mt. Carmel, Ill.

Civil Engineer with Widell, Finley Company.

Arthur E. Russell (XIII.), 97 Oak Street, Bath, Me.

Draughtsman, Engineer Department, Bath Iron Works.

Richard W. Senger (III.), Cananea, Sonora, Mex.

Chemist with Greene Consolidated Copper Company.

William F. Smart (IV.), 3441 Forbes Street, Pittsburg, Pa.

With Carnegie Steel Company.

Forest O. Sprague (V.), 78 Central Avenue, Everett, Mass.

Chemist with New England Gas & Coke Company.

Harry W. Upham (IX.), 10 Blackstone Street, Worcester, Mass.

Travelling Representative for Simplex Piano Player Company.

Herbert M. Wilcox (X.), 115 Paulison Avenue, Passaic, N.J.

With J. W. Ferguson Company, Contracting Engineers, Paterson.

Bartolette A. Yoder (I.), North Platte, Neb.

With Union Pacific R.R.

We give here a list of men whose address and occupations have been found for the first time:—

Arthur H. Abbott (VI.), 184 South Common Street, Lynn, Mass.

Joseph C. Baker (II.), 25 Cumberland Street, Boston, Mass.

Draughtsman with B. F. Sturtevant & Co., Hyde Park.

- Joseph H. Bakewell (II.), Pittsburg, Pa.
Clerk in Sales Department, Crucible Steel Company.
- Edward T. Barron (III.), 1152 Murray Hill Avenue, Pittsburg, Pa.
Steel and Cement Inspector, Duquesne Steel Works, Duquesne, Pa.
- Allan H. Barrows (V.), Washington, D.C.
Assistant Examiner, United States Patent Office.
- Edward H. Bartlett (X.), Delawanna, N.J.
Chemist with Waldrich Bleachery.
- George M. Bartlett (V.), 63 Kenwood Road, Boston, Mass.
Chemist, New England Gas & Coke Company.
- William F. Becker (VI.), 68 W. Washington Street, Chicago, Ill.
Foreman, Becker Brothers, Electrical Engineers.
- Robert Bixby (II.), 36 Cedar Street, Lynn, Mass.
With General Electric Company.
- Charles E. Broad (II.), 53 Commonwealth Avenue, Chestnut Hill, Mass.
With Stanley Motor Carriage Company, Newton.
- Frank W. Brownell (VI.), 10 Ten Broeck Street, Albany, N.Y.
With Consolidated Car Heating Company.
- Henry A. Buff (III.), 23 Cheshire Street, Jamaica Plain, Mass.
- Charles K. H. Bunting, Sp., Burlington, Vt.
Advertising and Circulating Manager, Burlington *Daily News*.
- Edward A. Burkhardt (XIII.), 6 Parley Vale, Jamaica Plain, Mass.
With Burkhardt Brewing Company.
- Harry P. Charlesworth (VI.), Hotel Thorndike, Haverhill, Mass.
Engineer Department, American Telephone & Telegraph Company.
- Walter B. Cain (XIII.), 10 Bates Avenue, E. Weymouth, Mass.
Student at M. I. T.
- George A. Casey (VI.), 31 State Street, Boston, Mass.
With H. I. Hahn & Co., Bankers.
- Leslie Clough (II.), 23 Avon Street, Wakefield, Mass.
With Bradlee & Chatman Company, Heating and Ventilating Engineers, 121 Beverly Street, Boston.
- Edgar B. Cooper (II.), Ponce, Porto Rico.
Superintendent Street Railway.
- Irving H. Cowdry (II.), Mass. Inst. Technology, Boston, Mass.
Assistant in Mechanical Engineering Drawing.
- David H. Cowell (VI.), 21 Monadnock Street, Dorchester, Mass.
- Harold G. Crane (VI.), Mass. Inst. Technology, Boston, Mass.
Assistant, Electrical Engineering Laboratory.

- Frank S. Craver (III.), Harvey, Ill.
Manager Glacial Mining Company, Martinsville, Ind.
- Carroll C. Curtis (IX.), 5 Beals Street, Brookline, Mass.
With Boston Insurance Company.
- Robert C. Cutting (II.), P.O. Box 11, Baden, Pa.
Inspector with United States Engineering Corps at Dam No. 4, Ohio River, Legionville.
- John C. Daly, Jr. (III.), 47 Townsend Street, Roxbury, Mass.
- John C. Damon (VI.), Tech Chambers, Boston, Mass.
Assistant in Electrical Engineering Laboratory, M. I. T.
- Philip G. Darling (II.), 158 Central Street, Winter Hill, Mass.
With Hancock Inspirator Company, Boston.
- David L. Davis (V.), Talavera-Neslva-Ecija, Luzon, P.I.
Teacher in Philippine Government Service.
- Charles L. Dean (III.), Buffalo, N.Y.
Bessemer Metallurgist, Lackawanna Steel Company.
- Henry L. Dean (XIII.), 90 Harvard Avenue, Hyde Park, Mass.
With B. F. Sturtevant Company.
- Albert C. Dickerman (XIII.), 21 Mill Street, Dorchester, Mass.
Draughtsman, Fore River Shipbuilding Company, Quincy.
- John F. Douglas (X., VIII., VI.), 103 Barrett Street, Schenectady, N.Y.
Tester with General Electric Company.
- Lewis D. Eaton (II.), Apartado 99, Simaloa, Mazatlan, Mexico, care A. B. Paine.
Surveying.
- Howard M. Edmunds (VI.), Nürnbergerstr. 65, Berlin, Germany.
Single Phase Railway work with the A. E. G., 43 Dorotheen Strasse.
- George B. Farnham (VI.), Wellesley, Mass.
With New England Telephone & Telegraph Company.
- Frank S. Farrell (V.), 178 Maple Street, Springfield, Mass.
- Robert D. Farrington (II.), Bellevue Street, W. Roxbury, Mass.
Student at M. I. T.
- Charles Field, 3d (V.), Room 14, Research Laboratory, M. I. T., Boston.
Research Chemist.
- Joseph C. Field (VI.), 346 West 19th Street, New York, N.Y.
Apprentice, Western Electric Company.
- William P. Field (VI.), 84 Bay View Avenue, Lynn, Mass.
Salesman, Crocker, Wheeler Company.

- True H. Files (I.), 14 Chestnut Street, Everett, Mass.
 Civil Engineer, care Ransome & Smith Company, New York Despatch.
- Howard H. Flagg (II.), 3344 Calumet Avenue, Chicago, Ill.
 Engineering and Sales Department, Crane Company.
- Ralph K. Forsyth (XIII.), 122 35th Street, Newport News, Va.
 With N. N. S. B. & D. D. Company.
- Elbert Fowler (XIII.), Griffin, Ga.
- Lawrence U. Fuller (II.), 26 Vine Street, W. Lynn, Mass.
 With Lynn Gas & Electric Company.
- Horace W. Gallup (V.), 52 Rector Street, Perth Amboy, N.J.
 Chemist, American Smelting & Refining Company.
- Robert S. Gardner (XIII.) M. I. T., Boston, Mass.
- Burton E. Geckler (IV.), 53 Howard Street, Springfield, Mass.
 Architectural Draughtsman, 476 Main Street.
- Thomas F. Geraghty (III.), 464 Elm Street, Chicago, Ill.
 Yard Foreman, Rolling Mill, Sellers Manufacturing Company.
- Ralph S. Gifford (V.), 112 Huntington Avenue, Boston, Mass.
 Assistant Instructor, M. I. T.
- William S. Gouinlock (III.), Warsaw, N.Y.
 With Warsaw Wilkinson Company.
- Ronan C. Grady, Sp., 897 Saratoga Street, East Boston, Mass.
 Midshipman, United States Navy.
- Errett McL. Graham (I.), Lovedale, Tenn.
 Resident Engineer, Southern & Western R.R.
- Edward Chester Grant (XIII.), Chicago, Ill.
 With Western Electric Company.
- Theodore Green (I.), 1056 Second Street, Louisville, Ky.
- William Green (VI.), 138 Eustis Street, Boston, Mass.
- Robert B. Gregson (II.), 43 Hurd Street, Lowell, Mass.
 With Hamilton Manufacturing Company.
- Fred W. Guibord (V.), 1621 13th Street, Washington, D.C.
 4th Assistant Examiner.
- Selskar Gunn (VII.), 739 Boylston Street, Boston, Mass.
 Boston Biological Chemical Laboratory.
- Clinton O. Harrington, Jr. (I.), 1024 Franklin Avenue, Wilksburg, Pa.
 With Union Switch & Signal Company, Swissvale.
- Herbert M. Hathaway (IV.), 1133 Broadway, New York, N.Y.
 With John Russell Pope, Architect.
- Harvey M. Hickok (I.), 210 Flour Exchange, Minneapolis, Minn.
 Design and Erection of Grain Elevators.

Warren S. Higgins (VI.), 183 Bakely Place, Brooklyn, N.Y.

Percy G. Hill (II.), Wallingford, Conn.

Cable Department, Southern New England Tel. Company, New Haven.

Harold G. Hixon (III.), 147 Logan Avenue, Denver, Col.

With Yak Mining, Milling & Tunnel Company, Leadville.

John H. Holliday, Jr. (II.), 1121 North Meridian Street, Indianapolis, Ind.

Special Apprentice, Atlas Engine Works.

George A. Hool (I.), 40 Eagle Street, Albany, N.Y.

Draughtsman, M. of W. Department, N. Y. C. & H. R. R.R., Mohawk Division.

Roger P. Ingalls (VI.), P.O. Box 308, Lexington, Mass.

Draughtsman with French & Hubbard, Boston.

Henry L. Jackson (V.), M. I. T., Boston, Mass.

Assistant in Oil Analysis.

Gilman B. Joslin (XIII.), 46 Burroughs Street, Jamaica Plain, Mass

Walter E. Kimball (VI.), 39 Standish Avenue, Wollaston, Mass.

Herman W. Lackman (II.), 819 W. Sixth Street, Cincinnati, Ohio.

Brewer.

James McC. Lambie (II.), P.O. Box 441, West Seneca, N.Y.

With Lackawanna Steel Company.

Leon K. Laney (II.), 615 E. University Avenue, Ann Arbor, Mich.

University of Michigan, Class '06.

Frank H. Langworthy (II.), 94 Hanover Street, Lynn, Mass.

Post-office Department, Lynn.

Lily M. Lewis (IV.), 603 Hampton Avenue, Wilkinsburg, Pa.

E. E. Lochridge, B.S., 43 Bridge Street, Springfield, Mass.

Engineer, Water Department of Springfield.

Warren W. Loomis, 12 Munroe Street, Roxbury, Mass.

With Stone & Webster.

Married April 21, 1904, to Gertrude L. Talmadge, of West Suffield, Conn.

Edward H. Lorenz (II.), 96 Garden Street, Hartford, Conn.

With Fenn-Sadler Machine Company.

John S. Loughlin (II.), 162 Adelphi Street, Brooklyn, N.Y.

Draughtsman, E. W. Bliss Company.

Andrew J. Lowndes (II.), 521 Clinton Avenue, Brooklyn, N.Y.

Horace J. Macintire (II.), Mass. Inst. Technology, Boston, Mass.

Assistant in Mechanical Engineering.

- Arthur J. Manson (VI.), 408 Whitney Avenue, Wilkesburg, Pa.
Apprentice, Westinghouse Electric & Manufacturing Company.
- Jason L. Merrill (V.), 143 Mott Terrace, Schenectady, N.Y.
Research Chemist.
- Oscar C. Merrill (I.), 2602 Dwight Way, Berkeley, Cal.
Instructor in Civil Engineering, University of California.
- Harold W. Mitchell, Sp., Cleveland Ohio.
Draftsman, Lincoln Electric Company.
- John H. Morse, Sp., Jacksonville, Ala.
Supervisor of Manual Training, Alabama State Normal School.
- Robert W. Morse (II.), 49 Holbrook Street, Jamaica Plain, Mass.
Barber Asphalt Paving Company, Land Title Building, Philadelphia, Pa.
- Walter N. Munroe (VI.), 56 Bowdoin Avenue, Dorchester Centre, Mass.
Student at M. I. T.
- Floyd A. Naramore (XIII.), 39 St. Botolph Street, Boston, Mass.
Student at M. I. T.
- Henry H. Neson, Jr. (II.), 16 Myrtle Street, Jamaica Plain, Mass.
Student at M. I. T.
- William A. Nelson (XIII.), 234 22d Street, Milwaukee, Wis.
- Robert P. Nichols (XIII., IX.), Commercial Wharf, Boston, Mass.
With Eastern Steamship Company.
- George C. Norton (IV.), 147 East 37th Street, New York, N.Y.
- Adolph John Ortseifen (XIII.), 514 East 46th Street, Chicago, Ill.
Treasurer of Henry Newgard & Co.
- Tom W. Osgood (III.), 406 8th Street, South, Fargo, No. Dak.
- Lowell H. Parker (I.), Osterville, Mass.
Assistant Engineer.
- Frank E. Payne (XIII.), 17 Battery Place, New York, N.Y.
Draftsman with Otis Elevator Company.
- Arthur Perkins (I.), 66 West 104th Street, New York, N.Y.
With C. B. Beach & Co., Publishers.
- Edward D. Perry (XIII.), Bath Iron Works, Bath, Me.
- Roland A. Perry (V.), 10 Chestnut Street, Medford, Mass.
- Thomas C. Pinkerton (V.), 93 Broad Street, Boston, Mass.
Chemist with A. D. Little.
- Frederick A. Pirie (II.), 48 Bradstreet Avenue, Beachmont, Mass.
Assistant with J. T. Wilson & Son, Nahant.
- Henry S. Pitts (IV.), 169 Angell Street, Providence, R.I.

James A. Pitts (II.), P.O. Box 619, Johannesburg, South Africa.

Assistant Engineer, Fraser & Chalmers.

Francis B. Riley (II.), Hanover, N.H.

Student Dartmouth College.

Charles L. Rodgers (II.), 418 Walker Street, Lowell, Mass.

Mechanical Engineer with Lamson Consolidated Store Service Company.

Milton L. Rubel (III.), Mascota, Estado de Jalisco, Mexico.

With The Lupita Mines Company.

Henry H. Russell (VI.), Claremont, N.H.

Assistant Superintendent, Maynard Rubber Company.

Ida A. Ryan (IV.), 19 Hammond Street, Waltham, Mass.

Graduate Student at M. I. T.

Frederic Van B. Sawin (II.), 11 Windom Street, West Somerville, Mass.

Equipment Inspector, New England Telephone & Telegraph Company, Boston.

Lane Schofield (III.), P.O. Box 234, Williamson, W. Va.

George W. Scott (XIII.), 220 Forest Street, Medford, Mass.

With Scott & Sons Company.

Samuel Seaver (XIII.), Waban, Mass.

Student at M. I. T.

Henry B. Siebrecht (VI.), 325 Broadway, Long Island City, N.Y.

Wholesale Growing Business.

Fred W. Simonds (I.), Utica, N.Y.

Assistant on Engineering Corps, N. Y. C. & H. R. R.R., Mohawk Division.

Russell B. Simons (XIII.), 65 Cleverly's Court, Quincy, Mass.

Assistant Inspector, Fore River Shipbuilding Company.

Willard E. Simpson (I.), 19 Linden Street, Allston, Mass.

Assistant, Civil Engineering Department, at M. I. T.

Charles E. Smart (II.), Claremont, N.H.

With Sullivan Machine Company.

Albert H. Smith (XIII.), 5 Elmwood Park, Malden, Mass.

Assistant at M. I. T.

Albert L. Smith (V.), 25 Dartmouth Street, Boston, Mass.

Assistant in Chemistry at M. I. T.

Preston M. Smith (X.), 1615 West Genesee Street, Syracuse, N.Y.

With Franklin Automobile Company.

Theodore L. Smith (II.), Concord, Mass.

Walter A. Staples (VI.), 130 Princess Street, St. John, N.B., Canada.

F. Charles Starr (I.), 19 McLellan Street, Dorchester, Mass.

Assistant in Civil Engineering Department at M. I. T.

Edward T. Steel (VI.), 6 Louisburg Square, Boston, Mass.

Student at M. I. T.

Harold C. Stetson (VI.), Wellesley Hills, Mass.

With New England Telephone & Telegraph Company.

Henry J. Stevenson (II.), 41 Princeton Street, East Boston, Mass.

Draughtsman, Library Bureau.

Theodore A. Stramblad, Sp., Hurdsfield, N. Dak.

James H. Tebbets (II.), 49 Grover Avenue, Winthrop Highlands, Mass.

With Lockwood, Green & Co.

Albert O. True (XI.), 2124 Farmers Bank Building, Pittsburg, Pa.

Engineer's Assistant, Pittsburg Filter Manufacturing Company.

LeBaron Turner (I.), Geneva, Ill.

With Engineering Department, Big Four R.R., Cincinnati, Ohio.

Robert N. Turner (I.), 17 Leonard Street, Waltham, Mass.

Boston University, Class '06, Boston University Law School, '07.

George G. Wald (III.), Bingham Canyon, Utah.

Sampler for Boston Consolidated Mining Company.

Frederick C. Wales (I.), 126 W. 127th Street, New York, N.Y.

Engineering Department, N. Y. C. & H. R. R.R.

Albert W. Walker (XI.), Belle Fourche, S.D.

Engineering Aid, United States Reclamation Service.

Roy W. Wastcoat (VI.), 140 Middleboro Avenue, Taunton, Mass.

Harry H. West (III.), 20 Plympton Street, Woburn, Mass.

Ralph N. Whitcomb (I.), 43-49 Exchange Place, New York, N.Y.

With J. G. White & Co.

Ray H. White (VIII.), 52 Beaver Street, New York, N.Y.

Chemical Engineer, care C. B. Jacobs.

Robert E. Wise (I.), South Lancaster, Mass.

Transitman, Massachusetts Harbor & Land Commission.

Milford Wortham (III.), 145 East 61st Street, New York, N.Y.

Mining Engineer.

NECROLOGY.

THEODORE SPENCER, '91

The death of Theodore Spencer at Philadelphia, on Jan. 28, 1906, of acute peritonitis, brought to a premature close the life of a young man who had risen in a very short time to a position of great responsibility.

Born on Aug. 19, 1870, at Camp Douglas, Utah, he was the eldest son of the late William E. Spencer, surgeon in the United States Army during the Civil War.

Graduated from the Institute as an electrical engineer in 1891, his first professional duties were with the Thomson-Houston Company, which was later the General Electric Company of Lynn, Mass. After a short term with this company he entered the engineering department of the American Bell Telephone Company at Boston.

The records of the Patent Office bear evidence of his inventive ability and skill while engaged in experimental work in the laboratories of the Bell Telephone Company. He was largely responsible for the development of the common battery system, whereby the cells at the instruments of the telephone subscribers were done away with, and the storage battery at the central office substituted; and it was principally through his work that this system, which is now in general use throughout the world, was brought to perfection. The first large common battery installation in the world was made in Philadelphia at No. 406 Market Street, and Mr. Spencer was sent here from Boston in 1894, as superintendent of electrical equipment, to supervise the work.

Later he was made engineer of the Bell Telephone Company of Philadelphia. He rapidly earned advancement to the position of general superintendent, and later general manager, and at the time of his death he was the general manager, vice-president, and one of the directors of the Bell Telephone Company, and of the Delaware

and Atlantic Telegraph and Telephone Companies, and was also vice-president and director of the Diamond State Telephone Company.

Although an engineer by training, and possessed of a broad technical knowledge, Mr. Spencer was endowed in a remarkable degree with executive ability, and with the most valuable of all abilities, "common sense." He was logical and far-sighted, and, when his keen judgment had determined on the course to be followed, his executive abilities enabled him to obtain his results economically and quickly.

A keen intellect and tireless energy, coupled with a remarkable initiative and administrative ability, swept before him difficulties which would have severely tried a man less fully equipped. A simple modesty and considerate demeanor, together with broadness of mind and nobility of character, won for him the love and admiration of all.

While we mourn the loss of one who at a very early age had reached a high position in the affairs of men, we cannot but feel that his life has been an inspiration to loftier and nobler ideals.

JOHN L. BATCHELDER, JR., '90.
PAUL W. ENGLAND, '91.

FREDERICK TALLMADGE TOWNE, '93

A YOUNG CAPTAIN OF INDUSTRY

Every Technology man will learn with deepest sorrow of the sudden death of Frederick Tallmadge Towne, '93, general superintendent of the Yale & Towne Manufacturing Company, who passed away at his home in Stamford, Conn., Feb. 4, 1906.

An acute attack of Bright's disease overcame him just as he had finished addressing a meeting of workmen at the factory on the occasion of the annual award of prizes for suggestions of mutual benefit to the firm and its employees. With the cheers of his men ringing in his ears, Mr. Towne sank into a chair in a state of collapse. Taken to an open window, he rallied for a moment, recog-

nized his wife, and uttered her name. After that he was unconscious to the end, which came at his home early the next morning.

Although but thirty-four years old, he had risen from the machine shop to the general superintendency of an industry which necessitated the closest familiarity with a multiplicity of intricate details such as hardly any other business calls for. Possessed of an unusual genius for organization, coupled with great executive ability, he directed his men with unerring judgment, and commanded their respect and love by his absolute fairness and fine sense of justice. His wish was that the Yale & Towne manufactory be a model one, not only in the quality of its product, but also in the relation between employer and employees, and with this in mind he had established a student course in the factory, where ambitious young men might make themselves more valuable.

As president of the National Founders' Association, Mr. Towne gained a national reputation by his skill and judgment in solving the many embarrassing questions of policy arising between that association and organized labor.

In his own city he commanded the respect and esteem of every one, and had more than once been mentioned as candidate for mayor.

As a friend, he proved himself loyal and unselfish, and his unswerving integrity and steadfastness of purpose will ever remain a worthy ideal to those who came in contact with him.

JOHN L. BATCHELDER, JR., '90.

HENRY TYLER WOODS, '93

H. T. Woods died very suddenly February 12, 1906, of meningitis. This news came as a sad shock to his many friends, since he had been in good health up to a week before his death.

Mr. Woods was born in Somerville, Mass., Nov. 24, 1870. He prepared for the Massachusetts Institute of Technology at the Somerville High School, and entered the Institute in the fall of 1889. While at the Institute, he took the mechanical engineering course, and received his degree in 1893. The following year he spent at

Harvard University, where he was graduated, and received the degree of Bachelor of Arts in June, 1904. After graduation he entered the wholesale coal business with the firm of Sturtevant, Norton & Co., where he remained for about two years, after which he went into business for himself as a wholesale coal dealer, in which business he was engaged up to the time of his last illness.

He was always an enthusiastic automobilist, and also took great interest in mountain trips, both in winter and summer. He was a member of the Appalachian Mountain Club, the Pembroke Country Club, and the New England Railroad Club.

Having attended both the Institute of Technology and Harvard University, he had a wide acquaintance around Boston, and leaves many friends who sincerely mourn his loss.

E. D. D., '93.

BOOK REVIEWS.

WHAT IS RELIGION? AND OTHER STUDENT QUESTIONS. TALKS TO
COLLEGE STUDENTS

BY HENRY S. PRITCHETT. x + 117 pp. Boston and New York:
Houghton, Mifflin & Co., 1906.

No one who has come into intimate contact with young men at an age when the sense of responsibility toward their fellow-men and toward the organizations existing in the communities in which they live is beginning to make itself felt can fail to realize that one of the most serious, and often the most perplexing, of their problems concerns their relations with the churches, and with those things for which the churches should stand. And, on the other hand, the situation is hardly less serious for the churches themselves; for there never was a time when these organizations were more in need of the co-operation and enthusiastic support of thoughtful young men than now, nor, perhaps, a time when there has apparently been a greater tendency to hold aloof. It is, therefore, eminently timely and proper that some one should deal fearlessly with these questions; and this Dr. Pritchett has done in an admirable way in the series of talks embodied in this little volume, which is dedicated to "the students whose friendship and fellowship form the inspiration of a college president's life."

The volume comprises five addresses, made before various groups of students. The titles are successively: "What is Truth?" "What is Religion?" "The Science of Religion," "The Significance of Prayer," and "Ought a Religious Man to join a Church?" The first talk contains a plea for the thoughtful development of individual convictions or beliefs rather than the mere acceptance of an inherited religion, and also a plea for tolerance. The second points out the distinction between dogma and religion, and dwells upon the conception of God as the source of energy of body, mind,

or spirit. The third address concerns itself with the development of the thought that religion cannot be compared with the exact sciences, and that its formulæ, as represented by creed or theological dogma, must necessarily be regarded as inexact expressions, which have often been framed under great stress of circumstances, although they are also "visions of truth as seen by great souls," and, as such, must always appeal strongly to many, if not all, thoughtful natures.

The dominant thought in the fourth address concerns the conception of prayer to which the "scientific spirit" and a rational conception of the Deity should lead. The subject is one with which it is so difficult to deal in a satisfying way that it should not be surprising if this address prove somewhat less acceptable than the others to many readers.

The final address deals frankly with some of the shortcomings of our churches as well as with their helpfulness when rightly used, and emphasizes clearly, on the one hand, that a formal membership in the churches does not in itself make a young man religious, while, on the other hand, failure to assume such a close relationship neither absolves him from the responsibility of becoming a truly religious man nor does it of itself in any way debar him from becoming such a man.

The particularly helpful features of these addresses are their avowedly *ad hominem* character and their directness in dealing with specific questions. The young man of religious tendencies, inherited or not, will find much to bid him pause and take account of the sincerity of his convictions, but nothing which should alienate him from anything which is good and sound in his life. The young man who is inclined to put aside all candid thought of religious affairs will find a call to duty; and the young man who has thought earnestly, but feared lest his inability fully to accept formulated creeds or dogma might condemn him as an irreligious man, will find great comfort.

H. P. TALBOT, '85.

THE INDIAN DISPOSSESSED

By SETH K. HUMPHREY (M. I. T. '97). With 16 full-page illustrations from photographs. Boston: Little, Brown & Co., 1906.

In this volume of three hundred pages the author vividly and feelingly sets forth the treatment of various tribes of reservation Indians by the United States government, quoting abundantly from public documents, and supplementing these generous extracts with pungent and interesting comments and criticisms. The tale certainly reflects little credit upon those in authority, and it is a story, too, which cannot fail to appeal to one's sympathies. And yet, granting many or even most of the claims urged in behalf of these wards of the nation, certain questionings may still arise. It may well have been a mistake ever to have dealt with the Indians by means of treaties, thus apparently conceding to them an unwarranted measure of independence and sovereignty. The fact, repeatedly referred to, that these treaties have often been nullified by subsequent acts of Congress, may be an example of bad morals, but such action is certainly not illegal or unconstitutional. Congress may equally override a treaty with England or France. Again, in spite of the author's vivid pictures and impassioned language, the reader will occasionally find himself confronted with the doubt as to whether the race is worth saving, anyway: not that we, as a people or as a government, should deliberately plot to wipe out the Indian, rather should we treat him with strict justice and equity. Nevertheless, it may be permissible to propound the query whether the interests of the human race as a whole demand exceptional or extraordinary consideration of this particular branch of it. The Indians are, however, gradually growing fewer and fewer. In three or four generations more they will probably cease to constitute a serious problem. Mr. Humphrey does well to call pointed attention to one phase of our national shortcomings, as illustrated by our treatment of the Indians, thus reminding us of our frailties, and perhaps dropping hints that will be of service in the solution of other race problems now on our hands.

C. F. A. C.